



RSA/Rule: RSA 482-A/ Env-Wt 100-900

WETLANDS PERMIT APPLICATION

Land Resources Management

Wetlands Bureau

Check the status of your application: www.des.nh.gov/onestop

Administrative Use Only	Administrative Use Only	Administrative Use Only	File No.
			Check No.
			Amount
			Initials

1. REVIEW TIME:

Indicate your Review Time below. Refer to Guidance Document A for instructions.

☒ Standard Review (Minimum, Minor or Major Impact)☐ Expedited Review (Minimum Impact only)**2. PROJECT LOCATION:**

Separate applications must be filed with each municipality that jurisdictional impacts will occur in.

ADDRESS: **I-89 Northbound, Southbound and Southbound On-Ramp**TOWN/CITY: **Lebanon**

TAX MAP:

BLOCK:

LOT:

UNIT:

USGS TOPO MAP WATERBODY NAME: **Mascoma River**☐ NASTREAM WATERSHED SIZE: **190 sq mi**☐ NA

LOCATION COORDINATES (If known):

☐ Latitude/Longitude ☐ UTM ☐ State Plane**3. PROJECT DESCRIPTION:**

Provide a brief description of the project outlining the scope of work. Attach additional sheets as needed to provide a detailed explanation of your project. DO NOT reply "See Attached" in the space provided below.

Preservation response to stabilize bridge from scour. The proposed work entails bank stabilization (rip-rapped slopes) along the banks of the Mascoma River to protect three bridges (097/112), (098/111) and (099/111) that carry the 5 lanes of I-89 through Lebanon.

4. SHORELINE FRONTAGE☐ NA This lot has no shoreline frontage.

SHORELINE FRONTAGE:

Shoreline frontage is calculated by determining the average of the distances of the actual natural navigable shoreline frontage and a straight line drawn between the property lines, both of which are measured at the normal high water line.

5. RELATED PERMITS, ENFORCEMENT, EMERGENCY AUTHORIZATION, SHORELAND, ALTERATION OF TERRAIN, ETC...**6. NATURAL HERITAGE BUREAU & DESIGNATED RIVERS:**

See the Instructions & Required Attachments document for instructions to complete a & b below.

a. Natural Heritage Bureau File ID: NHB **16** - **3588**b. ☒ Designated River the project is in ¼ miles of: **Mascoma**; anddate a copy of the application was sent to the Local River Management Advisory Committee: Month: ___ Day: ___ Year: ___☐ NAshoreland@des.nh.gov or (603) 271-2147

NHDES Wetlands Bureau, 29 Hazen Drive, PO Box 95, Concord, NH 03302-0095

www.des.nh.gov

7. APPLICANT INFORMATION (Desired permit holder)LAST NAME, FIRST NAME, M.I.: **NHDOT**

TRUST / COMPANY NAME:

MAILING ADDRESS: **7 Hazen Drive**TOWN/CITY: **Concord**STATE: **NH**ZIP CODE: **03301**EMAIL or FAX: **Jason.Tremblay@dot.nh.gov**PHONE: **603-271-2731**ELECTRONIC COMMUNICATION: By initialing here: **JAT**, I hereby authorize NHDES to communicate all matters relative to this application electronically**8. PROPERTY OWNER INFORMATION (If different than applicant)**

LAST NAME, FIRST NAME, M.I.:

TRUST / COMPANY NAME:

MAILING ADDRESS:

TOWN/CITY:

STATE:

ZIP CODE:

EMAIL or FAX:

PHONE:

ELECTRONIC COMMUNICATION: By initialing here _____, I hereby authorize NHDES to communicate all matters relative to this application electronically

9. AUTHORIZED AGENT INFORMATION

LAST NAME, FIRST NAME, M.I.:

COMPANY NAME:

MAILING ADDRESS:

TOWN/CITY:

STATE:

ZIP CODE:

EMAIL or FAX:

PHONE:

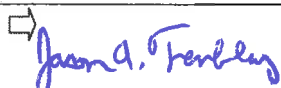
ELECTRONIC COMMUNICATION: By initialing here _____, I hereby authorize NHDES to communicate all matters relative to this application electronically

10. PROPERTY OWNER SIGNATURE:

See the Instructions & Required Attachments document for clarification of the below statements

By signing the application, I am certifying that:

1. I authorize the applicant and/or agent indicated on this form to act in my behalf in the processing of this application, and to furnish upon request, supplemental information in support of this permit application.
2. I have reviewed and submitted information & attachments outlined in the Instructions and Required Attachment document.
3. All abutters have been identified in accordance with RSA 482-A:3, I and Env-Wt 100-900.
4. I have read and provided the required information outlined in Env-Wt 302.04 for the applicable project type.
5. I have read and understand Env-Wt 302.03 and have chosen the least impacting alternative.
6. Any structure that I am proposing to repair/replace was either previously permitted by the Wetlands Bureau or would be considered grandfathered per Env-Wt 101.47.
7. I have submitted a Request for Project Review (RPR) Form (www.nh.gov/nhdhr/review) to the NH State Historic Preservation Officer (SHPO) at the NH Division of Historical Resources to identify the presence of historical/ archeological resources while coordinating with the lead federal agency for NHPA 106 compliance.
8. I authorize NHDES and the municipal conservation commission to inspect the site of the proposed project.
9. I have reviewed the information being submitted and that to the best of my knowledge the information is true and accurate.
10. I understand that the willful submission of falsified or misrepresented information to the New Hampshire Department of Environmental Services is a criminal act, which may result in legal action.
11. I am aware that the work I am proposing may require additional state, local or federal permits which I am responsible for obtaining.


Property Owner Signature


Print name legibly


07/10/17
Date

MUNICIPAL SIGNATURES

11. CONSERVATION COMMISSION SIGNATURE

The signature below certifies that the municipal conservation commission has reviewed this application, and:

1. Waives its right to intervene per RSA 482-A:11;
2. Believes that the application and submitted plans accurately represent the proposed project; and
3. Has no objection to permitting the proposed work.


		
Conservation Commission Signature	Print name legibly	Date

DIRECTIONS FOR CONSERVATION COMMISSION

1. Expedited review ONLY requires that the conservation commission's signature is obtained in the space above.
2. Expedited review requires the Conservation Commission signature be obtained **prior** to the submittal of the original application to the Town/City Clerk for signature.
3. The Conservation Commission may refuse to sign. If the Conservation Commission does not sign this statement for any reason, the application is not eligible for expedited review and the application will reviewed in the standard review time frame.

12. TOWN / CITY CLERK SIGNATURE

As required by Chapter 482-A:3 (amended 2014), I hereby certify that the applicant has filed four application forms, four detailed plans, and four USGS location maps with the town/city indicated below.

			
Town/City Clerk Signature	Print name legibly	Town/City	Date

DIRECTIONS FOR TOWN/CITY CLERK:

1. For applications where "Expedited Review" is checked on page 1, if the Conservation Commission signature is not present, NHDES will accept the permit application, but it will NOT receive the expedited review time.
2. IMMEDIATELY sign the original application form and four copies in the signature space provided above;
3. Return the signed original application form and attachments to the applicant so that the applicant may submit the application form and attachments to NHDES by mail or hand delivery.
4. IMMEDIATELY distribute a copy of the application with one complete set of attachments to each of the following bodies: the municipal Conservation Commission, the local governing body (Board of Selectmen or Town/City Council), and the Planning Board; and
5. Retain one copy of the application form and one complete set of attachments and make them reasonably accessible for public review.

DIRECTIONS FOR APPLICANT:

1. Submit the single, original permit application form bearing the signature of the Town/ City Clerk, all additional materials, and the application fee to NHDES by mail or hand delivery.

13. IMPACT AREA:

For each jurisdictional area that will be/has been impacted, provide square feet and, if applicable, linear feet of impact

Permanent: impacts that will remain after the project is complete.Temporary: impacts not intended to remain (and will be restored to pre-construction conditions) after the project is complete.

JURISDICTIONAL AREA	PERMANENT Sq. Ft. / Lin. Ft.	TEMPORARY Sq. Ft. / Lin. Ft.
Forested wetland	<input type="checkbox"/> ATF	<input type="checkbox"/> ATF
Scrub-shrub wetland	<input type="checkbox"/> ATF	<input type="checkbox"/> ATF
Emergent wetland	<input type="checkbox"/> ATF	<input type="checkbox"/> ATF
Wet meadow	<input type="checkbox"/> ATF	<input type="checkbox"/> ATF
Intermittent stream	/ <input type="checkbox"/> ATF	/ <input type="checkbox"/> ATF
Perennial Stream / River	8675 / 377 <input type="checkbox"/> ATF	6202 / 459 <input type="checkbox"/> ATF
Lake / Pond	/ <input type="checkbox"/> ATF	/ <input type="checkbox"/> ATF
Bank - Intermittent stream	/ <input type="checkbox"/> ATF	/ <input type="checkbox"/> ATF
Bank - Perennial stream / River	11258 / 371 <input type="checkbox"/> ATF	1221 / 90 <input type="checkbox"/> ATF
Bank - Lake / Pond	/ <input type="checkbox"/> ATF	/ <input type="checkbox"/> ATF
Tidal water	/ <input type="checkbox"/> ATF	/ <input type="checkbox"/> ATF
Salt marsh	<input type="checkbox"/> ATF	<input type="checkbox"/> ATF
Sand dune	<input type="checkbox"/> ATF	<input type="checkbox"/> ATF
Prime wetland	<input type="checkbox"/> ATF	<input type="checkbox"/> ATF
Prime wetland buffer	<input type="checkbox"/> ATF	<input type="checkbox"/> ATF
Undeveloped Tidal Buffer Zone (TBZ)	<input type="checkbox"/> ATF	<input type="checkbox"/> ATF
Previously-developed upland in TBZ	<input type="checkbox"/> ATF	<input type="checkbox"/> ATF
Docking - Lake / Pond	<input type="checkbox"/> ATF	<input type="checkbox"/> ATF
Docking - River	<input type="checkbox"/> ATF	<input type="checkbox"/> ATF
Docking - Tidal Water	<input type="checkbox"/> ATF	<input type="checkbox"/> ATF
TOTAL	19933 / 748	7423 / 549

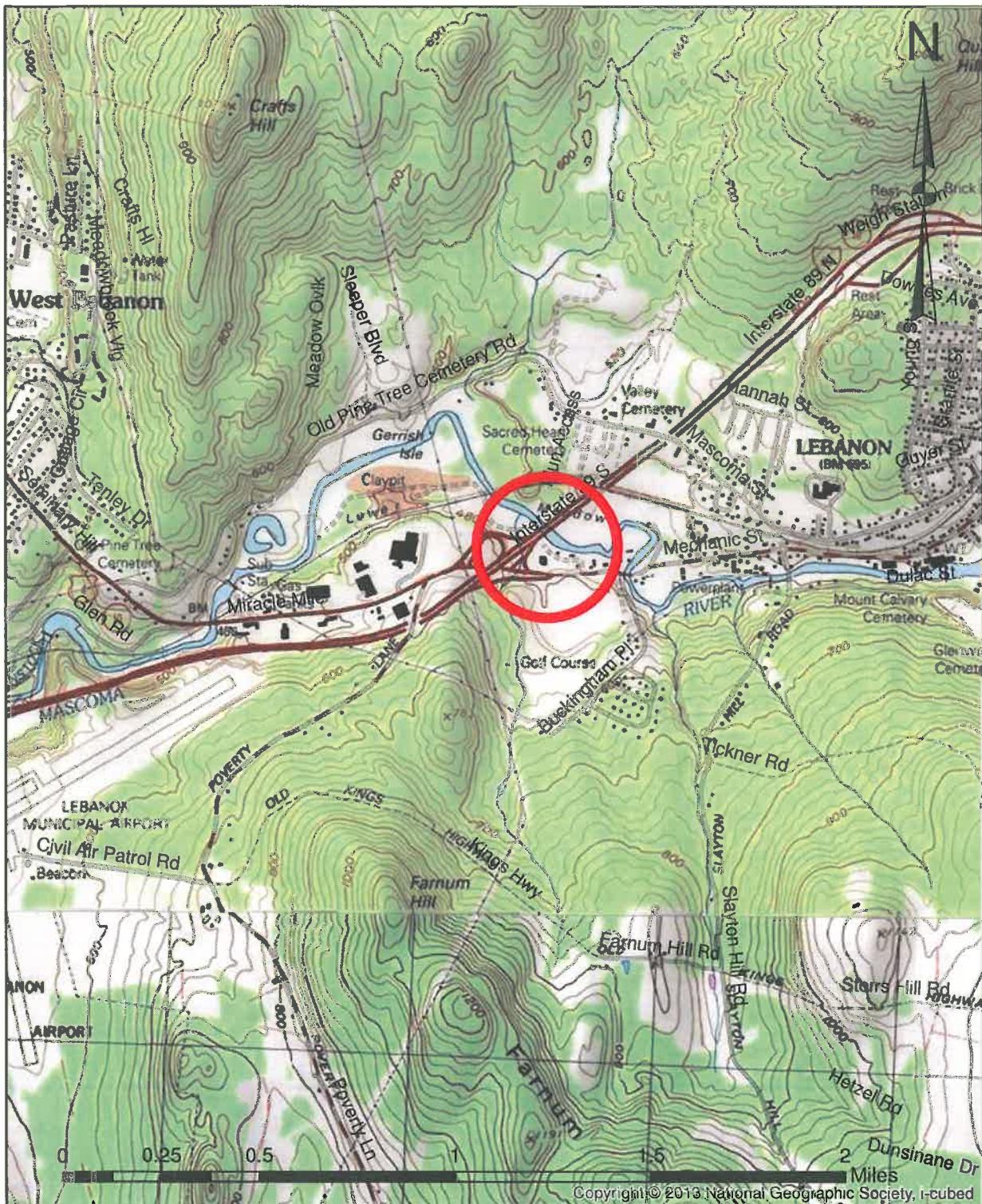
14. APPLICATION FEE: See the Instructions & Required Attachments document for further instruction☐ Minimum Impact Fee: Flat fee of \$ 200☒ Minor or Major Impact Fee: Calculate using the below table belowPermanent and Temporary (non-docking) 27356 sq. ft. X \$0.20 = \$ 5471.20Temporary (seasonal) docking structure: sq. ft. X \$1.00 = \$Permanent docking structure: sq. ft. X \$2.00 = \$Projects proposing shoreline structures (including docks) add \$200 = \$Total = \$ 5471.20The Application Fee is the above calculated Total or \$200, whichever is greater = \$ 5471.20

shoreland@des.nh.gov or (603) 271-2147

NHDES Wetlands Bureau, 29 Hazen Drive, PO Box 95, Concord, NH 03302-0095

www.des.nh.gov

Lebanon 097/112, 098/111, 099/111
I-89, NH 10 NB over Truck Road, Mascoma River
I-89 SB over Truck Road, Mascoma River
I-89 SB On Ramp over Truck Road, Mascoma River



1:24000



WETLANDS PERMIT APPLICATION – ATTACHMENT A MINOR AND MAJOR - 20 QUESTIONS

Land Resources Management

Wetlands Bureau

Check the Status of your application: www.des.nh.gov/onestop



RSA/ Rule: RSA 482-A, Env-Wt 100-900

Env-Wt 302.04 Requirements for Application Evaluation - For any major or minor project, the applicant shall demonstrate by plan and example that the following factors have been considered in the project's design in assessing the impact of the proposed project to areas and environments under the department's jurisdiction. Respond with statements demonstrating:

1. The need for the proposed impact.

Scour has removed existing stone fill from around the "south" piers and caused sloughing along the "south" bank and the lower portion of the "north" bank. Keyed rip-rap will be placed around and on the pier footings and on the "north" and "south" slopes to stabilize the bridge structure from scour. It is anticipated that access to these areas will be from the "southeast" quadrant and "northwest" quadrant.

2. That the alternative proposed by the applicant is the one with the least impact to wetlands or surface waters on site.

The alternative proposed is the one with the least impact to the wetlands and surface waters since it is replacing the existing material that has been washed away due to scour. The proposed alternative meets the needs at the site to protect the existing infrastructure and extend the lifetime of a structure that is in good condition.

shoreland@des.nh.gov or (603) 271-2147

NHDES Wetlands Bureau, 29 Hazen Drive, PO Box 95, Concord, NH 03302-0095
www.des.nh.gov

3. The type and classification of the wetlands involved.

**R3RB2: Riverine upper perennial rock rubble
BANK**

4. The relationship of the proposed wetlands to be impacted relative to nearby wetlands and surface waters.

The Mascoma River flows into the Connecticut River.

5. The rarity of the wetland, surface water, sand dunes, or tidal buffer zone area.

The Mascoma River is a designated river.

6. The surface area of the wetlands that will be impacted.

14,877 ft2 Riverine (6,202 ft2 temporary, 8,675 ft2 permanent)

12,479 ft2 Bank (1,221 ft2 temporary, 11,258 ft2 permanent)

7. The impact on plants, fish and wildlife including, but not limited to:
- a. Rare, special concern species;
 - b. State and federally listed threatened and endangered species;
 - c. Species at the extremities of their ranges;
 - d. Migratory fish and wildlife;
 - e. Exemplary natural communities identified by the DRED-NHB; and
 - f. Vernal pools.

There are no rare or special concern species identified within the proposed project area.

According to information provided by the New Hampshire Fish and Game Department, there are not documented Northern Long-Eared Bat roost trees or hibernacula in Lebanon. The 27287 Statewide Project qualifies for review in accordance with the FHWA, FRA, FTA Programmatic Consultation for Transportation Projects within the Range of the Indiana Bat and Northern Long-eared Bat. As the project meets the requirements for review under the Programmatic Consultation, the project may rely on the concurrence provided in the FHWA, FRA, FTA Programmatic Biological Opinion for Transportation Projects within the Range of the Indiana Bat and Northern Long-eared Bat to satisfy consultation requirements under Section 7 of the Endangered Species Act. Project activities will adhere to applicable avoidance and minimization measures. The project has been determined to be likely to adversely affect (LAA) the threatened Northern Long-Eared Bat due to proposed active season tree clearing. A bridge assessment is planned to survey the bridge for evidence of bat utilization. If any indication of bat use of the bridge is discovered, the project construction will not be initiated until completion of consultation with USFWS. A copy of the project details, the bridge assessment results, and the determination of LAA IPaC decision key results will be submitted to the USFWS Regional Office.

There are no species known to be at the extremities of their ranges located in Mascoma River or the surrounding area.

There will be no impact on migratory fish and wildlife within the proposed project area.

There are no exemplary natural communities identified by the DRED-NHB within the proposed project area.

There are no vernal pools identified within the project area.

8. The impact of the proposed project on public commerce, navigation and recreation.

The proposed project will not impact public commerce, navigation or recreation once completed. The scour preservation work will reestablish existing conditions of the banks and streambed.

9. The extent to which a project interferes with the aesthetic interests of the general public. For example, where an applicant proposes the construction of a retaining wall on the bank of a lake, the applicant shall be required to indicate the type of material to be used and the effect of the construction of the wall on the view of other users of the lake.

The project will not interfere with the aesthetic interests of the general public. The rip-rap proposed will be on the banks and keyed into the channel, which will blend in with the existing material currently at these locations.

10. The extent to which a project interferes with or obstructs public rights of passage or access. For example, where the applicant proposes to construct a dock in a narrow channel, the applicant shall be required to document the extent to which the dock would block or interfere with the passage through this area.

The proposed project will not interfere with or obstruct public rights of passage or access. Once completed, the scour preservation work will maintain the same previous access.

11. The impact upon abutting owners pursuant to RSA 482-A:11, II. For example, if an applicant is proposing to rip-rap a stream, the applicant shall be required to document the effect of such work on upstream and downstream abutting properties.

The project will not have an impact on abutting properties. The scour preservation work will reestablish the banks and channel to existing conditions. The proposed project will not alter the risk of flooding on abutting properties. Access will remain as it exists currently once the project is complete.

12. The benefit of a project to the health, safety, and well being of the general public.

The project will protect the bridge from being undermined due to scour. This will allow the bridge to remain open to benefit commerce, trade, emergency access, etc, for the general public.

13. The impact of a proposed project on quantity or quality of surface and groundwater. For example, where an applicant proposes to fill wetlands the applicant shall be required to document the impact of the proposed fill on the amount of drainage entering the site versus the amount of drainage exiting the site and the difference in the quality of water entering and exiting the site.

The proposed project will not significantly alter the existing surface water runoff or storm water discharge locations. Best Management Practices will be used to prevent any adverse effect to water quality during construction.

14. The potential of a proposed project to cause or increase flooding, erosion, or sedimentation.

Flooding: The scour protection will not increase the potential for flooding. The proposed structure is able to pass the 100 year storm event.

Erosion: The riprap will prevent further erosion and preserve the natural alignment and gradient of the stream channel.

Sedimentation: Nothing that will be a barrier to sediment transport will be installed in this project. Sedimentation in the open channel will not be caused as a result of this project.

15. The extent to which a project that is located in surface waters reflects or redirects current or wave energy which might cause damage or hazards.

Surface waters will not be reflected or redirected as a result of this project. Mascoma River does not have enough surface water for wave energy to be an issue.

16. The cumulative impact that would result if all parties owning or abutting a portion of the affected wetland or wetland complex were also permitted alterations to the wetland proportional to the extent of their property rights. For example, an applicant who owns only a portion of a wetland shall document the applicant's percentage of ownership of that wetland and the percentage of that ownership that would be impacted.

The work consists of scour protection to stabilize the existing bridge. There are no similar structures in the vicinity owned by other parties that would require repair.

17. The impact of the proposed project on the values and functions of the total wetland or wetland complex.

The value of the wetland as a habitat for living organisms will be unchanged. A function of Mascoma River is to carry water from a higher elevation to a lower elevation. This project will not interfere with that function.

18. The impact upon the value of the sites included in the latest published edition of the National Register of Natural Landmarks, or sites eligible for such publication.

This project is not located in or near any Natural Landmarks listed on the National Register.

19. The impact upon the value of areas named in acts of Congress or presidential proclamations as national rivers, national wilderness areas, national lakeshores, and such areas as may be established under federal, state, or municipal laws for similar and related purposes such as estuarine and marine sanctuaries.

There are no areas named in acts of congress or presidential proclamations as national rivers, national wildness areas, or national lakeshores that will be impacted as a result of this project.

20. The degree to which a project redirects water from one watershed to another.

The project as proposed will not redirect water from one watershed to another.

Additional comments

shoreland@des.nh.gov or (603) 271-2147

NHDES Wetlands Bureau, 29 Hazen Drive, PO Box 95, Concord, NH 03302-0095
www.des.nh.gov

BUREAU OF ENVIRONMENT CONFERENCE REPORT

SUBJECT: NHDOT Monthly Natural Resource Agency Coordination Meeting

DATE OF CONFERENCE: May 17, 2017

LOCATION OF CONFERENCE: John O. Morton Building

ATTENDED BY:

NHDOT

Matt Urban
Sarah Large
Steve Johnson
Mark Hemmerlein
Jason Trembley
Wendy Johnson
Jim Kirouac
Joseph Adams
Michael Licciardi
Jonathan Hebert

**Federal Highway
Administration**

Jamie Sikora

ACOE

Rick Cristoff

US Coast Guard

Jim Rousseau

NHDES

Gino Infascelli
Lori Sommer
Eben Lewis

NHF&G

Carol Henderson

**NH Natural Heritage
Bureau**

Amy Lamb

**Consultants/Public
Participants**

Jim Murphy
Dan Hageman
Stephanie Dyer-Carroll
Mike Long
Dave Kull
Steve Hoffmann
Ben Martin
John Parrelli
Sean James
Kimberly Peace

(When viewing these minutes online, click on an attendee to send an e-mail)

PRESENTATIONS/ PROJECTS REVIEWED THIS MONTH:

(minutes on subsequent pages)

Finalization April 19 th , 2017 Meeting Minutes	2
Westmoreland, #41394 (Non-federal)	2
Derry, #40572 (Non-federal)	2
Gorham, #41393 (Non-federal)	3
New Castle-Rye, 16127 (X-A001(146))	4
Statewide, #27287 (X-A003(473))	6
Nashua-Merrimack-Bedford, #13761 (IM-0931(201))	8
Nashua Heritage Trail to Mine Falls Park Connection, #40429 (X-A004(400))	9

(When viewing these minutes online, click on a project to zoom to the minutes for that project)

downstream wing wall. The work will not involve any dredge; just placement of stone in existing scour holes and the stone will be placed on top of the existing silt. Access will be from the southern upstream wing wall bank. The ACOE was concerned about leaving as much natural channel as possible. The NH Wetlands Bureau indicated no mitigation was necessary for the work and the ACOE confirmed this work would qualify under the PGP.

Hinsdale 132/113 NH route 63 over the Ashuelot River

The proposed work involves placing stone on both abutments, all four wing walls and the pier. Access to the river will be from the northerly and southerly downstream embankments. There are utility corridors on both sides of the river; overhead electric on the north and underground sewer on the south. NH Wetlands requested red maples be replanted once the work is complete to restore the banks. A causeway will be constructed from the north banks to the pier. The wetlands application will be sent to the Ashuelot Local Advisory Committee. The NH Wetlands Bureau indicated no mitigation was necessary for the work and the ACOE confirmed this work would qualify under the PGP.

Lebanon 097/112, 098/111, 099/111, I-89 over the Mascoma River

* The proposed work involves placing stone on both embankments and northerly piers. Access to the northerly embankment will be from the northbound barrel and access to the southerly embankment and piers will be from Truck road. Mark noted the depth of the scour within the bridge as almost 6 feet as the stone covered the exposed footing by three feet and there was at least three feet to the water line in the pictures. There were some questions about the knotweed in the project and it was discussed that it would not be spread by the proposed action. The ACOE encourage the Department to keep the stone flat at the waterline to accommodate wildlife passage. The NH Wetlands Bureau indicated no mitigation was necessary for the work and the ACOE confirmed this work would qualify under the PGP.

Peterborough 108/116 US 202/NH Route 123 over the Contoocook River

The proposed work involves placing stone around the pier. Access will be from the southerly downstream embankment. ACOE discussed possible floodway and floodplain impacts and it was agreed there would be none for this proposed work. The NH Wetlands Bureau indicated no mitigation was necessary for the work and the ACOE confirmed this work would qualify under the PGP.

Plainfield 162/100, NH Route 120 over Bloods Brook

The proposed work involves placing stone on both abutments, and both upstream wing walls. Access will be from the easterly upstream bank. The NH Wetlands Bureau indicated no mitigation was necessary for the work and the ACOE confirmed this work would qualify under the PGP.

Westmoreland 109/124 NH Route 63 over Mill Brook

The proposed work involves placing stone on the southerly upstream wing wall. Also included are five bendway weirs to address severe erosion on the southerly upstream bank. Gino commented that the bendway weirs looked like they needed to be turned upstream more and requested we coordinate with USGS on the fluvial geomorphology. The group agreed this was a good approach to address the scour at this location. Access will be from the southern upstream bank. The NH

StreamStats Report

Region ID:

NH

Workspace ID:

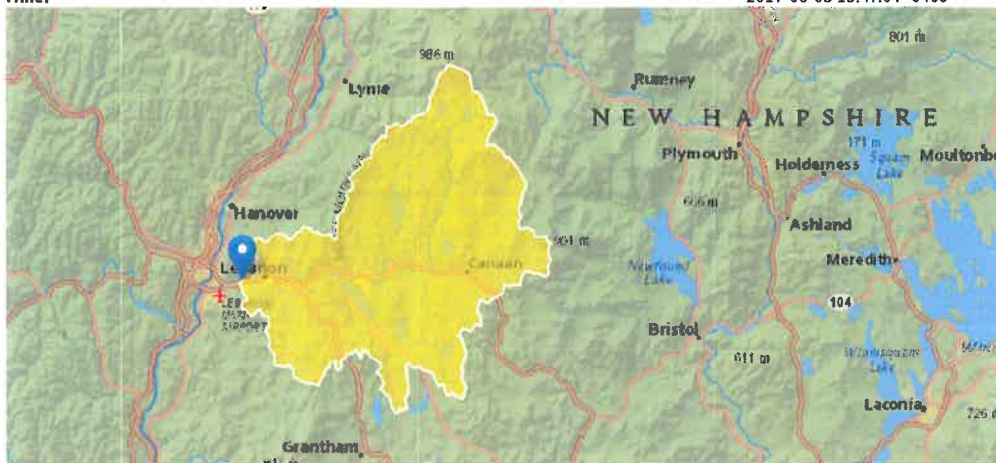
NH20170605134504011000

Clicked Point (Latitude, Longitude):

43.63926, -72.27865

Time:

2017-06-05 13:47:04 -0400



Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	190.37	square miles
CONIF	Percentage of land surface covered by coniferous forest	23.2702	percent
PREBC0103	Mean annual precipitation of basin centroid for January 1 to March 15 winter period	6.38	inches
BSLDEM30M	Mean basin slope computed from 30 m DEM	12.39	percent
MIXFOR	Percentage of land area covered by mixed deciduous and coniferous forest	25.7899	percent
PREG_03_05	Mean precipitation at gaging station location for March 16 to May 31 spring period	7.8	inches
TEMP	Mean Annual Temperature	43.215	degrees F
TEMP_06_10	Basinwide average temperature for June to October summer period	59.549	degrees F
PREG_06_10	Mean precipitation at gaging station location for June to October summer period	17.2	inches
ELEVMAX	Maximum basin elevation	3217.65	feet

General Disclaimers

The delineation point is in an exclusion area.

**NH Department of Transportation
Bureau of Bridge Design
Statewide 27287 – Lebanon Br. No. 097/112, 098/111, 099/111
Env-Wt 904.09 Alternative Design
TECHNICAL REPORT**

Env-Wt 904.09(a) - If the applicant believes that installing the structure specified in the applicable rule is not practicable, the applicant may propose an alternative design in accordance with this section.

Please explain why the structure specified in the applicable rule is not practicable (Env-Wt 101.69 defines practicable as *available and capable of being done after taking into consideration costs, existing technology, and logistics in light of overall project purposes.*)

Mascoma River has a drainage area of 190.4 square miles which qualifies this stream as a Tier 3 Crossing. The required span based on the NH Stream Crossing Guidelines for a new crossing would be 198 feet. A structure of this size would typically cost approximately \$11,000,000. Spending this much money on a structure that could be adequately preserved for approximately \$200,000 would not be a practicable use of resources. There would be a significant increase in wetland impacts if a structure of this size were installed due to the additional footprint for construction.

The proposed alternative meets the specific design criteria for Tier 2 and Tier 3 crossings to the *maximum extent practicable*, as specified below.

Env-Wt 904.05 Design Criteria for Tier 2 and Tier 3 Stream Crossings – New Tier 2 stream crossings, replacement Tier 2 crossings that do not meet the requirements of Env-Wt 904.07, and new and replacement Tier 3 crossings shall be designed and constructed:

(a) In accordance with the NH Stream Crossing Guidelines.

The NH Stream Crossing Guidelines do not mention maintenance to a structure in a Tier 3 watershed.

The proposed scour preservation work will match the existing slope and alignment.

The bottom of the existing structure will not be changed as a result of this project.

Wildlife passage will remain the same through the existing structure.

The proposed work will maintain the flow depths found in the existing structure.

The proposed work will still allow the 100 year flood event to pass.

(b) With bed forms and streambed characteristics necessary to cause water depths and velocities within the crossing structure at a variety of flows to be comparable to those found in the natural channel upstream and downstream of the stream crossing.

Water depths and velocities within the crossing at a variety of flows will be comparable to the existing depths and velocities. These flows are comparable to those found in the natural channel upstream and downstream of the stream crossing.

(c) To provide a vegetated bank on both sides of the watercourse to allow for wildlife passage.

Since the scour preservation work will be placing rip-rap to replace the stone that has scoured away, it is not possible to provide vegetated banks on both sides of the watercourse below the roadway.

(d) To preserve the natural alignment and gradient of the stream channel, so as to accommodate natural flow regimes and the functioning of the natural floodplain.

The natural alignment and gradient of the stream channel will be brought back to existing conditions prior to the scour taking place. The existing structure can pass the 100 year storm event and this project will not change the capacity. Surface waters will not be reflected or redirected as a result of this project.

(e) To accommodate the 100-year frequency flood, to ensure that (1) there is no increase in flood stages on abutting properties; and (2) flow and sediment transport characteristics will not be affected in a manner which could adversely affect channel stability.

The riprap will not alter the potential of flooding. The existing structure can pass the 100 year storm event and this project will not change the capacity. The project as proposed will not alter the chance of flooding on abutting properties.

(f) To simulate a natural stream channel.

The center of the stream channel is currently a natural bottom and will not be changed as a result of this project.

(g) So as not to alter sediment transport competence.

Nothing that will be a barrier to sediment transport will be installed in this project.

Env-Wt 904.09(c)(3) – The alternative design must meet the general design criteria specified in Env-Wt 904.01:

Env-Wt 904.01

(a) Not be a barrier to sediment transport;

Nothing that will be a barrier to sediment transport will be installed in this project.

(b) Prevent the restriction of high flows and maintain existing low flows;

The rip-rap for scour protection will not significantly alter the existing high and low flows.

(c) Not obstruct or otherwise substantially disrupt the movement of aquatic life indigenous to the waterbody beyond the actual duration of construction;

The same degree of aquatic passage will remain within the existing structure.

(d) Not cause an increase in the frequency of flooding or overtopping of banks;

The rip-rap for scour protection will not alter the potential of flooding. The structure can pass the 100 year storm event and this project will not change the capacity. The project as proposed will not alter the chance of flooding on abutting properties.

(e) Preserve watercourse connectivity where it currently exists;

Connectivity will remain unchanged with the proposed structure.

(f) Restore watercourse connectivity where: (1) Connectivity previously was disrupted as a result of human activity(ies); and (2) Restoration of connectivity will benefit aquatic life upstream or downstream of the crossing, or both;

Connectivity will remain unchanged with the proposed structure and will not be worsened. Aquatic life upstream and downstream will not be affected as a result of this project.

(g) Not cause erosion, aggradation, or scouring upstream or downstream of the crossing; and

The riprap will prevent erosion and scour, and preserve the natural alignment and gradient of the stream channel. Nothing that will be a barrier to sediment transport will be installed in this project.

(h) Not cause water quality degradation.

The project as proposed will not impact the quantity or quality of surface and/or groundwater at this site. Best Management Practices will be used to prevent any adverse effect to water quality during construction.

*****Note: An alternative design for Tier 1 stream crossings must meet the general design criteria (Env-Wt 904.01) only to the *maximum extent practicable*.**



New Hampshire Natural Heritage Bureau

To: Sarah Large
7 Hazen Drive
Concord, NH 03301

Date: 11/30/2016

From: NH Natural Heritage Bureau

Re: Review by NH Natural Heritage Bureau of request dated 11/30/2016
NHB File ID: NHB16-3588

Applicant: NHDOT

Location: Tax Map(s)/Lot(s):
Lebanon

Project Description: Installation of bridge scour protection

The NH Natural Heritage database has been checked for records of rare species and exemplary natural communities near the area mapped below. The species considered include those listed as Threatened or Endangered by either the state of New Hampshire or the federal government. We currently have no recorded occurrences for sensitive species near this project area.

A negative result (no record in our database) does not mean that a sensitive species is not present. Our data can only tell you of known occurrences, based on information gathered by qualified biologists and reported to our office. However, many areas have never been surveyed, or have only been surveyed for certain species. An on-site survey would provide better information on what species and communities are indeed present.

This report is valid through 11/29/2017.



MAP OF PROJECT BOUNDARIES FOR NHB FILE ID: NHB16-3588





United States Department of the Interior



FISH AND WILDLIFE SERVICE
New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
Phone: (603) 223-2541 Fax: (603) 223-0104
<http://www.fws.gov/newengland>

In Reply Refer To:

June 08, 2017

Consultation Code: 05E1NE00-2017-SLI-1795

Event Code: 05E1NE00-2017-E-03930

Project Name: Statewide 27287

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 et seq.), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the

human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

<http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF>

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 et seq.), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (<http://www.fws.gov/windenergy/>) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm>; <http://www.towerkill.com>; and <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html>.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
(603) 223-2541

Project Summary

Consultation Code: 05E1NE00-2017-SLI-1795

Event Code: 05E1NE00-2017-E-03930

Project Name: Statewide 27287

Project Type: TRANSPORTATION

Project Description: The Statewide 27287 Project involves the placement of stone protection at six locations to repair scour issues on a number of bridges.

- Cornish 172/148 NH Route 12 over Blow Me Down Brook: The proposed work involves placing stone on the northern abutment footing; both downstream wing walls, and the northern upstream wing wall.
- Hinsdale 132/113 NH route 63 over the Ashuelot River: The proposed work involves placing stone on both abutments, all four wing walls and the pier. Access to the river will be from the northerly and southerly downstream embankments.
- Lebanon 097/112, 096/011, 099/111, I-89 over the Mascoma River: The proposed work involves placing stone on both embankments and northerly piers. Access to the northerly embankment will be from the northbound barrel and access to the southerly embankment and piers will be from Truck road.
- Peterborough 108/116 NH Route 9 over the Contoocook River: The proposed work involves placing around the pier. Access with be from the southerly downstream embankment. ACOE discussed possible floodway and floodplain impacts and it was agreed there would be none for this proposed work.
- Plainfield 162/100, NH Route 120 over Blood Brook: The proposed work involves placing stone on both abutments, and both upstream wing walls. Access will be from the easterly upstream bank.
- Westmoreland 109/129 NH Route 63 over Mill Brook: The proposed work involves placing stone on the southerly upstream abutment and wing wall. Also included are five bendway weirs address severe erosion on the southerly upstream bank.

Project Location:

Approximate location of the project can be viewed in Google Maps:

<https://www.google.com/maps/place/42.99145541314799N72.44521671667101W>



Counties: Cheshire, NH | Grafton, NH | Hillsborough, NH | Sullivan, NH

Endangered Species Act Species

There is a total of 1 threatened, endangered, or candidate species on your species list. Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area. Please contact the designated FWS office if you have questions.

Mammals

NAME

STATUS

Northern Long-eared Bat (*Myotis septentrionalis*) Threatened

No critical habitat has been designated for this species.

Species profile: <https://ecos.fws.gov/ecp/species/9045>

Critical habitats

There are no critical habitats within your project area.

Appendix B Certification – Projects with Minimal Potential to Cause Effects

Date Reviewed: 6/5/2017

Project Name: Statewide

State Number: 27287

FHWA Number: X-A003(473)

Environmental Contact: Mark Hemmerlein

DOT

Email Address: Mhemmerlein@dot.state.nh.us

Project

Dave Scott

Manager:

Project Description: Actions to stabilize various bridges from scour, including placement of stone in the river channels and banks. Proposed right of entry to the rivers involves constructing temporary access roads down the banks and stone causeways in the rivers. Work will be completed on six (6) bridge locations: Cornish (172/148) NH route 120 over Blow-Me-Down Brook, Hinsdale 132/113 NH Route 63 over the Ashuelot River, Lebanon (097/112, 098/111, 099/111) I-89 over the Mascoma River, Peterborough (108/116) US Route 202 over the Contoocook River, Plainfield (162/100) NH Route 120 over Blood Brook, and Westmoreland (109/124) NH Route 63 over Mill Brook

Please select the applicable undertaking type(s):

<input type="checkbox"/>	1. Modernization and general highway maintenance <u>that may require additional highway right-of-way or easement</u> , and which is <u>not within the boundaries of a historic property or district</u> , including:
	Choose an item. Choose an item.
<input type="checkbox"/>	2. Non-historic bridge and culvert maintenance, renovation, or total replacement, <u>that may require minor additional right-of-way or easement</u> , and which is <u>not within the boundaries of a historic property or district</u> , including:
	Choose an item. Choose an item.
<input type="checkbox"/>	3. Historic bridge maintenance activities within the limits of existing right-of-way, including:
	Choose an item. Choose an item.
<input checked="" type="checkbox"/>	4. Stream stabilization and restoration activities (including removal of debris or sediment obstructing the natural waterway, or any non-invasive action to restore natural conditions).
<input type="checkbox"/>	5. Construction of bicycle lanes and pedestrian walkways, sidewalks, shared-use paths and facilities, small passenger shelters, and alterations to facilities or vehicles in order to make them accessible for elderly and handicapped persons, <u>not within the boundaries of a historic property or district</u> .
<input type="checkbox"/>	6. Installation of bicycle racks, <u>not within the boundaries of a historic property or district</u> .
<input type="checkbox"/>	7. Recreational trail construction, <u>not within the boundaries of a historic property or district</u> .
<input type="checkbox"/>	8. Recreational trail maintenance when done on existing alignment.
<input type="checkbox"/>	9. Modernization, maintenance, and safety improvements of railroad facilities within the existing railroad or highway right-of-way, <u>not within the boundaries of a historic property or district, and no historic railroad features are impacted</u> , including, but not limited to:
	Choose an item. Choose an item.
<input type="checkbox"/>	10. Acquisition or renewal of scenic, conservation, habitat, or other land preservation easements
<input type="checkbox"/>	11. Installation of Intelligent Transportation Systems.

Section 106 Programmatic Agreement – Cultural Resources Review Effect Finding

Appendix B Certification – Projects with Minimal Potential to Cause Effects

Please describe how this project is applicable under Appendix B of the Programmatic Agreement.

The sites were reviewed by the NHDOT BOE Cultural Resources program staff. It was determined that there were no historic resources at any of the sites that would be impacted by the proposed action. In addition, access to the water was reviewed and in all cases the access was over ground that was previously disturbed by prior bridge construction or utility installations. There will be no impacts to existing bridge components including but not limited to decks, abutments or piers.

NHDOT in-house projects: Please append photographs, USGS maps, design plans and as-built plans, if available, for review.

LPA projects: Please submit this Certification Form along with the Transportation RPR

Coordination Efforts:

Has an RPR been submitted to NHDOT for this project?	Not Applicable	NHDHR R&C # assigned?	N/A
Please identify public outreach effort contacts; method of outreach and date:	<u>None; these are bridge maintenance activities.</u>		

Finding: (To be filled out by NHDOT Cultural Resources Staff)

<input checked="" type="checkbox"/>	No Potential to Cause Effects	<input type="checkbox"/>	No Historic Properties Affected
This finding serves as the Section 106 Memorandum for your environmental documents, no further coordination is necessary.			
<input type="checkbox"/>	This project does not comply with Appendix B, and will continue under the Section 106 review process outlined in 36 CFR 800.3-800.7. Please contact NHDOT Cultural Resources Staff to determine next steps.		
<div style="display: flex; justify-content: space-between; align-items: flex-end;"> <div style="width: 45%;"> <p style="font-size: 1.2em; margin: 0;"><i>Shirley Charles</i></p> <hr style="border: 0; border-top: 1px solid black; margin: 5px 0;"/> <p>NHDOT Cultural Resources Staff</p> </div> <div style="width: 45%; text-align: right;"> <p>6/5/2017</p> <hr style="border: 0; border-top: 1px solid black; margin: 5px 0;"/> <p>Date</p> </div> </div>			

Coordination of the Section 106 process should begin as early as possible in the planning phase of the project (undertaking) so as not to cause a delay.

Project sponsors should not predetermine a Section 106 finding under the assumption that an undertaking conforms to the types listed in Appendix B until this form is signed by the NHDOT Bureau of Environment Cultural Resources Program staff.

Every project shall be coordinated with, and reviewed by the NHDOT-BOE Cultural Resources Program in accordance with the Cultural Resources Programmatic Agreement among the Advisory Council on Historic Preservation, Federal Highway Administration, NH Department of Transportation, and the State Historic Preservation Office. In accordance with the Advisory Council's regulations, we will continue to consult, as appropriate, as this project proceeds.

If any portion of the undertaking is not entirely limited to any one or a combination of the types specified in Appendix B (with, or without a portion that is included as a type listed in Appendix A), please continue discussions with NHDOT Cultural Resources staff.

Section 106 Programmatic Agreement – Cultural Resources Review Effect Finding

Appendix B Certification – Projects with Minimal Potential to Cause Effects

This No Potential to Cause Effect or No Historic Properties Affected project determination is your Section 106 finding, as defined in the Programmatic Agreement.

Should project plans change, please inform the NHDOT Cultural Resources staff in accordance with Stipulation VII of the Programmatic Agreement.



US Army Corps
of Engineers
New England District

U.S. Army Corps of Engineers
New Hampshire Programmatic General Permit (PGP)
Appendix B - Corps Secondary Impacts Checklist
(for inland wetland/waterway fill projects in New Hampshire)

1. Attach any explanations to this checklist. Lack of information could delay a Corps permit determination.
2. All references to "work" include all work associated with the project construction and operation. Work includes filling, clearing, flooding, draining, excavation, dozing, stumping, etc.
3. See PGP, GC 5 regarding single and complete projects.
4. Contact the Corps at (978) 318-8832 with any questions.

	Yes	No
1. Impaired Waters		
1.1 Will any work occur within 1 mile upstream in the watershed of an impaired water? See http://des.nh.gov/organization/divisions/water/wmb/section401/impaired_waters.htm to determine if there is an impaired water in the vicinity of your work area.*		X
2. Wetlands	Yes	No
2.1 Are there are streams, brooks, rivers, ponds, or lakes within 200 feet of any proposed work?	X	
2.2 Are there proposed impacts to SAS, shellfish beds, special wetlands and vernal pools (see PGP, GC 26 and Appendix A)? Applicants may obtain information from the NH Department of Resources and Economic Development Natural Heritage Bureau (NHB) website, www.nhnaturalheritage.org , specifically the book <u>Natural Community Systems of New Hampshire</u> .		X
2.3 If wetland crossings are proposed, are they adequately designed to maintain hydrology, sediment transport & wildlife passage?	X	
2.4 Would the project remove part or all of a riparian buffer? (Riparian buffers are lands adjacent to streams where vegetation is strongly influenced by the presence of water. They are often thin lines of vegetation containing native grasses, flowers, shrubs and/or trees that line the stream banks. They are also called vegetated buffer zones.)	X	
2.5 The overall project site is more than 40 acres.	X	
2.6 What is the size of the existing impervious surface area?	0	
2.7 What is the size of the proposed impervious surface area?	0	
2.8 What is the % of the impervious area (new and existing) to the overall project site?	0	
3. Wildlife	Yes	No
3.1 Has the NHB determined that there are known occurrences of rare species, exemplary natural communities, Federal and State threatened and endangered species and habitat, in the vicinity of the proposed project? (All projects require a NHB determination.)		X
3.2 Would work occur in any area identified as either "Highest Ranked Habitat in N.H." or "Highest Ranked Habitat in Ecological Region"? (These areas are colored magenta and green, respectively, on NH Fish and Game's map, "2010 Highest Ranked Wildlife Habitat by Ecological Condition.") Map information can be found at: <ul style="list-style-type: none"> • PDF: www.wildlife.state.nh.us/Wildlife/Wildlife_Plan/highest_ranking_habitat.htm. • Data Mapper: www.granit.unh.edu. • GIS: www.granit.unh.edu/data/downloadfreedata/category/databycategory.html. 		X
3.3 Would the project impact more than 20 acres of an undeveloped land block (upland, wetland/waterway) on the entire project site and/or on an adjoining property(s)?		X
3.4 Does the project propose more than a 10-lot residential subdivision, or a commercial or industrial development?		X
3.5 Are stream crossings designed in accordance with the PGP, GC 21?	X	

4. Flooding/Floodplain Values	Yes	No
4.1 Is the proposed project within the 100-year floodplain of an adjacent river or stream?	X	
4.2 If 4.1 is yes, will compensatory flood storage be provided if the project results in a loss of flood storage?	N/A	
5. Historic/Archaeological Resources		
If a minor or major impact project, has a copy of the Request for Project Review (RPR) Form (www.nh.gov/nhdhr/review) been sent to the NH Division of Historical Resources as required on Page 5 of the PGP?**	X	

*Although this checklist utilizes state information, its submittal to the Corps is a Federal requirement.

** If project is not within Federal jurisdiction, coordination with NH DHR is not required under Federal law.



Northern Embankment



Northern Embankment



Northern Embankment



Southern Embankment



Southern Embankment



Southern Embankment

Lebanon Br. No. 097/112, 098/111, 099/111 Construction Sequence

All activities to use BMP for erosion control

1. Set up perimeter control
2. Construct stable access points
 - "SW" corner for "south" side
 - Access road underneath bridge for "north" side
3. Set up water diversion structure (i.e. sandbags)
4. Dewater area
5. Install stone fill
6. Remove water diversion structure
7. Remove access
8. Stabilize access area

PART WT 404 CRITERIA FOR SHORELINE STABILIZATION

The I-89 over Mascoma River preservation response to stabilize the bridges from scour proposes the placement of rip-rap within the jurisdictional areas of the N.H. Wetlands Board and the U.S. Army Corps of Engineers. Rip-rap will be placed at the abutment bank slopes of the existing bridges.

Pursuant to PART Wt 404 Criteria for Shoreline Stabilization, the following addresses each codified section of the Administrative Rules:

Wt 404.01 Least Intrusive Method

The shoreline stabilization treatment proposed is the least intrusive construction method necessary to protect the existing shorelines from further scour. The stone treatment can be reasonably constructed utilizing general highway construction methods.

Wt 404.02 Diversion of Water

The area where the rip-rap is being replaced will be behind either a cofferdam or water diversion structure so that the Mascoma River can continue to flow in front of the diversion.

Wt 404.03 Vegetative Stabilization

Natural vegetation will be left undisturbed to the maximum extent possible. The only locations being disturbed are the areas that previously had stone.

Wt 404.04 Rip-Rap

- (a) Stone fill as proposed is shown on the attached plans to protect the existing embankments in front of the abutments and wingwalls and around the piers from erosion and scour. Stable embankments are necessary to maintain the structural integrity of the bridge during all instances of flood flows.
- (b) (1-5) The enclosed specifications for Rip-Rap Class V (Item 583.5) provides the description of the material size, gradation, and construction requirements. Cross sections of the stone fill showing proposed thickness and other details, including Geotextile, Permanent Control Class 1, Non-Woven (Item 593.411) have been provided on the attached plans. Bedding for the stone fill will consist of natural ground excavated to the proposed underside of the stone fill in conformance with Section 203 of the Specifications.
- (b) (6) Enclosed are plan sheets to sufficiently indicate the relationship of the project to fixed points of reference, abutting properties, and features of the natural shoreline.
- (b) (7) For reasons as explained in Section (a), rip-rap is recommended for the limits shown on the attached plans.
- (c) N/A

- (d) Stone fill is proposed to extend down to and adequately keyed into the channel bottom to prevent possible undermining of the shore slope. This will involve extending the stone beyond the two foot limit as specified in the Criteria for Shoreline Stabilization, Wt 404.04.
- (e) Engineering plans are being provided as a part of the application for rip-rap in excess of 100 linear feet along the stream bank (approximately 184 linear feet of rip-rap is proposed along the north stream bank and approximately 187 linear feet along the south stream bank). Since the project has not advertised final stamped plans are not available. It is not anticipated that the location of the rip-rap will change therefore the plans are stamped with the understanding that if the location of the rip-rap changes, DES will be notified accordingly.

SECTION 583 -- RIPRAP**Description**

1.1 This work shall consist of furnishing and placing riprap as shown on the plans or ordered. Riprap is typically required for erosion protection of bridge structures in waterways, for active waterway channel slopes and bottoms, and for intermittent waterway channels where the Engineer determines riprap protection is required to resist expected high water flow velocities.

Materials

2.1 Riprap shall be quarry stone of approved quality, hard, durable, sub-angular to angular in shape, resistant to weathering and free from structural defects such as weak seams and cracks.

2.1.1 The suitable shape of the individual stones shall be angular, meeting the gradation in 2.1.1.2 to create interlocking riprap to provide stability of the slope or channel. Round, thin and platy, elongated or needle-like shapes shall not be used.

2.1.1.1 The suitable riprap stone shape is determined by the Length to Thickness ratio, where Length is the longest dimension and Thickness is the shortest dimension, measured in perpendicular axes to each other. The suitable riprap stone shape shall have a length to thickness ratio of no greater than 3.

2.1.1.2 The gradation requirements of the riprap classes in Table 583-1 are based on the stone size Width, the largest dimension perpendicular to the Length and Thickness, and the distribution of stone sizes by volume. The volume distribution requires that 15 percent of the stone in the mass shall be no larger than the volume shown in the table (< 15% column), and 15 percent of the stone in the mass shall be no smaller than the volume shown in the table (> 85% column). The remaining 70 percent of the stone in the mass shall have a volume between these requirements, averaging to the volume shown in the table (15% - 85% column). None of the stones in the mass shall exceed the maximum volume shown in the table (Maximum column).

Table 583-1

Riprap Classes and Sizes			Percentage Distribution of Particle Sizes by Volume (cubic feet)			
Class	Nominal Size (in)	Maximum Size (in)	< 15%	15% – 85%	> 85%	Maximum
I	6	12	0.05	0.14	0.31	1.0
III	12	24	0.4	1.0	2.5	6.5
V	18	36	1.3	3.5	8.5	22
VII	24	48	3	8	19	53
IX	36	72	10	27	65	179

Note: Nominal Size and Maximum Size are based on the Width dimension of the stone. The riprap classes conform to the standard classes described in the FHWA HEC-23 publication.

2.1.2 The sources from which the stone is obtained shall be selected well in advance of the time when the material will be required in the field. The acceptability of the riprap stone shape and grading will be determined by the Engineer.

2.1.3 Control of the gradation will be completed by visual inspection approval by the Engineer of a stockpile at the quarry or other agreed site. Mechanical equipment as needed to assist in checking the stockpile gradation shall be provided by the Contractor. Stockpile replenishment will require re-approval.

2.2 Gravel blanket material shall conform to 209.2.1.2.

2.3 Geotextile shall conform to 593.2.

Construction Requirements

3.1 Preparation of slopes. Slopes that will be covered by riprap shall be free of brush, trees, stumps, and other organic material and shall be graded to a smooth surface. All soft material shall be removed to the depth shown on the plans or as directed and replaced with approved material per 203.3.6. It is the Contractor's responsibility to protect embankments and excavated slopes from erosion during construction of the riprap covered slope.

3.2 Gravel blanket construction. When called for on the plans, the gravel blanket shall be placed on the prepared area to the specified thickness in one operation, using methods which will not cause segregation of particle sizes within the layer. The surface of the finished layer shall be even and free from mounds or windrows.

3.3 Geotextile placement. Geotextile shall be placed in accordance with 593.3.

3.4 Riprap placement. Riprap shall be constructed to the dimensions shown on the plans or as directed by the Engineer.

- 3.4.1** Placement of riprap shall be conducted as soon as possible after gravel blanket or geotextile placement.
- 3.4.2** Placement of the riprap shall be started at the toe (key trench) and progress up the slope. The key trench at the bottom of the riprap shall be constructed as shown on the plans. If bedrock is encountered at the key trench it shall be brought to the attention of the Engineer to determine if modification to the riprap installation is needed.
- 3.4.3** Riprap shall be placed over geotextile by methods that do no stretch, tear, puncture or reposition the fabric. Riprap smaller than 1.5 cu. ft. in volume shall be placed with drop heights of less than 3 ft. to the placement surface. Riprap greater than 1.5 cu. ft. in volume shall be placed with no free fall height.
- 3.4.4** Equipment such as a clamshell, orange-peel bucket, skip or hydraulic excavator shall be used to place the riprap so it is well distributed and there is no large accumulations of either the larger or smaller sizes of stone. Dump trucks or front-end loaders tracked or wheeled vehicles shall not be used since they can destroy the interlocking integrity of the stone when driven over previously placed riprap. Placing the riprap by end dumping on the slopes will cause segregation and will not be permitted.
- 3.4.5** The riprap shall be placed in a manner which produces a well-graded mass. The larger stones shall be well distributed and the entire mass of riprap shall conform approximately to the gradation specified. Hand placing or rearranging of individual stones by mechanical equipment may be required to the extent necessary to secure the uniformity of gradation and surface specified. Fill voids between larger stones with small stones to ensure interlocking between the riprap.
- 3.4.6** After the riprap is in place, it shall be compacted by impacting (ramming) the exposed surface to produce a tight, locked surface, not varying more than 6" from the elevations shown on the plans.
- 3.4.7** Riprap placed in water requires close observation and increased quality control to ensure the required thickness, gradation and coverage is achieved.

Method of Measurement

- 4.1** Riprap will be measured by the cubic yard.
- 4.1.1** If the Engineer determines that in-place measurement is impracticable, the quantity for payment will be determined by loose measure in the hauling vehicle on the basis that 1 cubic yard vehicle measure is equivalent to 0.7 cubic yard in place.

Basis of Payment

- 5.1** The accepted quantity of riprap will be paid for at the Contract unit price per cubic yard (cubic meter) complete in place.
- 5.1.1** Only when the stone is examined in accordance with 2.1 and examination proves the gradation to be acceptable will payment be made as provided in 109.04.
- 5.1.2** Gravel blanket material specified or ordered will be paid for under Section 209.
- 5.1.3** Geotextile specified or ordered will be paid for under Section 593.
- 5.1.4** The accepted quantity of excavation required for placing riprap and for placing any underlying gravel blanket will be paid for under the item of excavation being performed. Excavation above refers only to excavation of original ground or to material ordered removed not shown on the plans.
- 5.1.5** Free borrow will not be required to replace the accepted quantity of stone obtained from the excavation. However, when the plans do not call for borrow but the quantity of material removed from excavation for use under this item requires the Contractor to furnish borrow to complete the work, such borrow will be subsidiary.
- 5.1.6** Replacement slope material resulting from the requirements of 3.1 will be paid in accordance with 203.5.1.9.

Pay item and unit:

583.1	Riprap, Class I	Cubic Yard
583.3	Riprap, Class III	Cubic Yard
583.5	Riprap, Class V	Cubic Yard
583.7	Riprap, Class VII	Cubic Yard
583.9	Riprap, Class IX	Cubic Yard

SECTION 593 -- GEOTEXTILE**Description**

1.1 This work shall consist of furnishing and installing geotextile fabric as shown on the plans or as ordered, including any labor and materials needed to anchor, splice, or repair the geotextile.

Materials**2.1 General.**

2.1.1 Geotextile shall be a product tested under the AASHTO National Transportation Product Evaluation Program (NTPEP) and included on the Qualified Products List for the Application, Strength Class, and Structure specified. Manufacturers of geotextiles and those marketing geotextiles made by others as a "Private Labeler" shall participate in and maintain compliance with the NTPEP audit program for geotextiles. Manufacturer's labels providing product name, AASHTO M288 class, roll number, and production date shall be affixed to both ends of the roll.

2.1.2 All geotextile properties referenced in the specifications and certified by the Contractor, with the exception of Apparent Opening Size (AOS), shall be considered minimum average roll values in the weaker principal direction (i.e., the average test results for any sampled roll in a lot shall meet or exceed the minimum values specified). Values for AOS shall represent maximum average roll values.

2.1.3 Fibers used in the manufacture of geotextiles, and threads used in joining geotextiles by sewing, shall meet the requirements of the most current version of the applicable sections of AASHTO M 288.

2.1.4 Geotextile shall exhibit an ultraviolet stability (retained strength) of at least 50% after 500 hours of exposure, measured in accordance with ASTM D 4355.

2.2 Application.

Following are the basic Applications of geotextile included under this specification. Applications are described according to their most common use(s) and may not include every function for which a geotextile is specified.

2.2.1 Application 1 – Subsurface Drainage. Geotextile for this Application consists of fabric placed against a soil to allow for long-term passage of water into a subsurface drain system while retaining the in situ soil.

2.2.2 Application 2 – Separation. Geotextile for this Application consists of fabric placed to prevent mixing of in situ or subgrade soil with aggregate cover materials.

2.2.3 Application 3 – Stabilization. Geotextile for this Application consists of fabric placed in wet, saturated conditions to provide the coincident functions of separation and filtration. This Application may also be specified for geotextiles used to provide the function of reinforcement.

2.2.4 Application 4 – Permanent Erosion Control. Geotextile for this Application consists of fabric placed below riprap or other armor systems to prevent soil loss and/or instability of the erosion control system.

2.3 Strength Class. Following are the basic Strength Classes of geotextile included under this specification:

2.3.1 Class 1, Class 2, and Class 3. Geotextile specified as Class 1 (high strength), Class 2 (medium strength), or Class 3 (low strength) shall meet the applicable requirements of AASHTO M 288, Table 1, including sewn seam strength when sewn seams are used. A higher strength geotextile may be substituted for a lower strength geotextile provided all other specification requirements are met.

2.3.2 Class 0. Geotextile specified as Class 0 (extra high strength) shall meet the following minimum requirements:

Geotextile Property	Test Method	Property Requirement Pounds
Grab Tensile Strength	ASTM D 4632	375
Sewn Seam Strength	ASTM D 4632	335
Tear Strength	ASTM D 4533	135
Puncture Strength	ASTM D 6241	1237

2.4 Structure. The Contract Item Number for geotextile includes a designation for Structure that defines the basic composition of the fabric. Geotextile shall conform to the specified structure as identified by the Item Number.

2.5 Permittivity and Apparent Opening Size (AOS). Geotextile shall meet the requirements for permittivity and Apparent Opening Size (AOS) as described in the Geotextile Qualification Criteria Document. Located on the Department's Website.

SECTION 593

2.6 Each roll shall be clearly labeled so as to easily identify the product in the field. The label shall include as a minimum the manufacturer's name, product name and number, and the Contract Item name and number.

2.7 Staples or Pins. Staples or pins required to hold the geotextile prior to placing overlying materials shall be those prescribed by the geotextile manufacturer.

Construction Requirements

3.1 Protection of Geotextile. To prevent damage to the fabric, the Contractor shall exercise necessary care while transporting, storing, and installing the fabric. Prior to installation, the fabric shall be protected from weather, direct sunlight or other ultra-violet exposure, and from dust, mud, dirt, debris, and other elements which may affect its performance. Fabric that is torn, punctured, or otherwise damaged shall not be placed. After placement, fabric shall be covered within 5 days. Traffic or construction equipment shall not be permitted directly on the geotextile.

3.2 Placement of Geotextile and Overlying Materials. The geotextile and overlying materials shall be placed in accordance with the plans, the manufacturer's requirements, and the following:

3.2.1 General. Prior to placement of the fabric, the site shall be prepared to provide a smooth surface which is free from debris, obstructions, and depressions which could result in gaps, tears, or punctures in the fabric during cover operations.

3.2.1.1 Successive sheets placed above water shall be overlapped by a minimum of 18". Sheets placed below water shall be sewn or overlapped by a minimum of 3 feet. Larger overlaps may be called for on the plans or required by the Engineer in soft soil conditions or if gaps between adjacent sheets occur during placement of overlying material. Pins or staples may be used to anchor the fabric as directed by the Engineer.

3.2.2 Subsurface Drainage. Trench excavation shall be done in accordance with details shown on the plans. In all instances, excavation shall be done in such a way so as to prevent large voids from occurring in the sides and bottom of the trench.

3.2.2.1 The geotextile shall be placed loosely with no wrinkles or folds, and with no void spaces between the geotextile and the ground surface. Successive sheets shall be shingled such that the upstream sheet is placed over the downstream sheet.

3.2.2.2 Placement of drainage aggregate shall proceed immediately following placement of the geotextile. The geotextile shall be covered with a minimum of 12" of loosely placed aggregate prior to compaction. If a collector pipe is to be installed in the trench, a bedding layer of drainage aggregate shall be placed below the pipe, with the remainder of the aggregate placed to the minimum required construction depth.

3.2.2.3 After placing the drainage aggregate, the geotextile shall be folded over the top of the aggregate in a manner that produces the overlap shown on the plans. In no case shall the minimum overlap be less than 12".

3.2.3 Separation/Stabilization. The installation site shall be prepared by clearing, grubbing, and removal of vegetation and topsoil. The site shall be excavated or filled to the proper grade as shown on the plans or as ordered. The Engineer may order that soft spots and unsuitable areas identified during site preparation or subsequent proof rolling be excavated, backfilled, and compacted with suitable materials.

3.2.3.1 The geotextile shall be laid smooth without wrinkles or folds on the prepared subgrade, except that it may be folded or cut to conform to curves. Joints and overlaps shall be in the direction shown on the plans or as ordered by the Engineer. The folds or overlaps shall be held in place by pins, staples, or piles of fill or rock.

3.2.3.2 Overlying fill or aggregate materials shall be placed by end dumping onto the geotextile from the edge of the geotextile, or over previously placed materials. Construction vehicles shall not be allowed directly on the geotextile. Materials shall be placed such that at least the minimum specified lift thickness is between the geotextile and equipment tires or tracks at all times. Turning of vehicles shall not be allowed on the first lift above the geotextile.

3.2.3.2.1 On very soft subgrades, the fill or aggregate shall be spread to the proper lift thickness as soon as possible after dumping to minimize the potential of localized subgrade failure due to concentrated loading.

3.2.3.2.2 In stabilization applications, vibratory compaction equipment on the initial lift of fill or aggregate material may be prohibited by the Engineer to prevent damage to the geotextile.

3.2.3.3 Placement procedures that result in instability or damage to the geotextile shall be modified to eliminate further damage. The Engineer may order remedial measures such as increasing the initial lift thickness or decreasing equipment loads.

3.2.3.4 Geotextile placed below temporary fills shall be completely removed immediately after the fill is removed. Geotextile salvaged from use under temporary fills shall not be used for any permanent application in the project unless approved by the Engineer.

3.2.4 Permanent Erosion Control. The geotextile shall be placed in intimate contact with the soils without wrinkles or folds, and anchored on a smooth graded surface approved by the Engineer. The geotextile shall be placed in such a manner that placement

of the overlying materials will not excessively stretch or tear the geotextile. Anchoring of the terminal ends of the geotextile shall be accomplished through the use of key trenches or aprons at the crest and toe of the slope as shown on the plans.

3.2.4.1 The geotextile shall be placed with the machine direction (long direction of the roll) parallel to the direction of water flow, which is normally parallel to the slope for erosion control runoff and wave action, and parallel to the stream or channel in the case of stream bank and channel protection. When overlapping, the fabric shall be placed such that the uphill sheet is placed over the downhill sheet, and the upstream sheet is placed over the downstream sheet. In cases where wave action or multidirectional flow is anticipated, all seams perpendicular to the direction of flow shall be sewn.

3.2.4.2 The armor system placement shall begin at the toe and proceed up the slope. Placement shall take place so as to avoid stretching, puncturing, and tearing of the geotextile. Particles smaller than 1.5 cubic feet, shall be placed with drop heights less than 3 feet. Particles greater than 1.5 cubic feet shall be placed with no free fall. Drop heights exceeding the distance specified above may be allowed by the Engineer if field tests demonstrate that larger drop heights will not result in damage to the fabric. In no case shall stones be rolled or pushed onto the geotextile.

3.2.4.3 The geotextile and armor materials shall be placed the same day in underwater applications.

3.2.4.4 Field monitoring shall be performed to verify that the armor system placement does not damage the geotextile. Fabric which is damaged as a result of careless or improper placement of stone, grading techniques, or equipment traffic above the stone shall be repaired or replaced in accordance with 3.3.

3.3 Repair of Geotextile. Fabric that is damaged during or after placement shall be replaced or repaired by stitching or patching at the expense of the Contractor. Patches shall be of the same material as the placed geotextile. The patch shall be joined to the existing fabric using overlapped seams as specified above or as directed by the Engineer.

3.3.1 The Contractor shall modify his placement or covering procedures to eliminate further or repeated damage from occurring.

3.4 Sewn Seams. Sewn seams, if specified, ordered, or allowed, shall result in a joint at least as strong as the sewn seam strength requirements described in 2.3. Field or factory seaming will be permitted unless otherwise specified. Sewn seams shall be lapped a minimum of 4" and double sewn using Stitch Type 401 as depicted in ASTM D 6193. Either a "J" seam (Type SSn-2) or "Butterfly" seam (Type SSd-2) shall be used as shown in Figure 1.

3.4.1 All seams shall be subject to the approval of the Engineer. Sewn seams shall be positioned on the exposed side of the fabric to allow for inspection and/or repair of the fabricated joint. Seams shall not be positioned as shown in Figure 2.

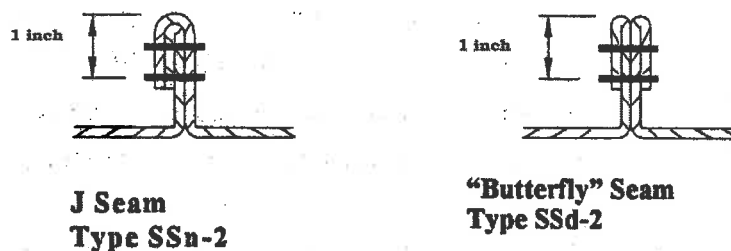
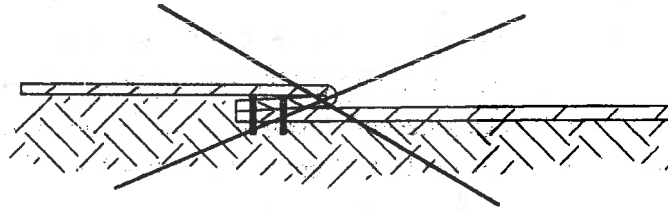


FIGURE 1



Cannot Inspect or Repair

FIGURE 2

Method of Measurement

4.1 Geotextile will be measured by the square yard as determined by the actual surface measurements of the covered area. Additional material used for overlaps and repairs will not be measured.

Basis of Payment

5.1 The accepted quantity of geotextile will be paid for at the Contract unit price per square yard for the application, strength class, and structure specified, complete in place. The cost of all labor or materials used to anchor, splice, or repair the geotextile is considered subsidiary to the geotextile installation. Removal of temporary geotextile will be considered subsidiary to the geotextile installation.

Pay Item and Unit:

593.A B C

Square Yard

Key:

A= Application

- 1 = Subsurface Drainage
- 2 = Separation
- 3 = Stabilization
- 4 = Permanent Erosion Control

B = Strength Class

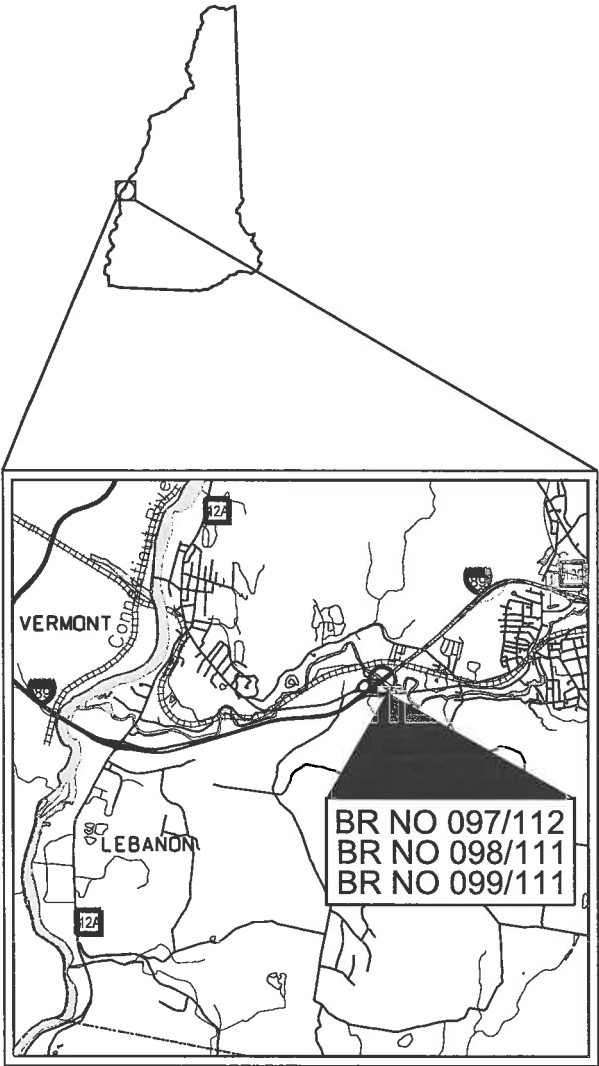
- 0 = Class 0
- 1 = Class 1
- 2 = Class 2
- 3 = Class 3

C = Structure

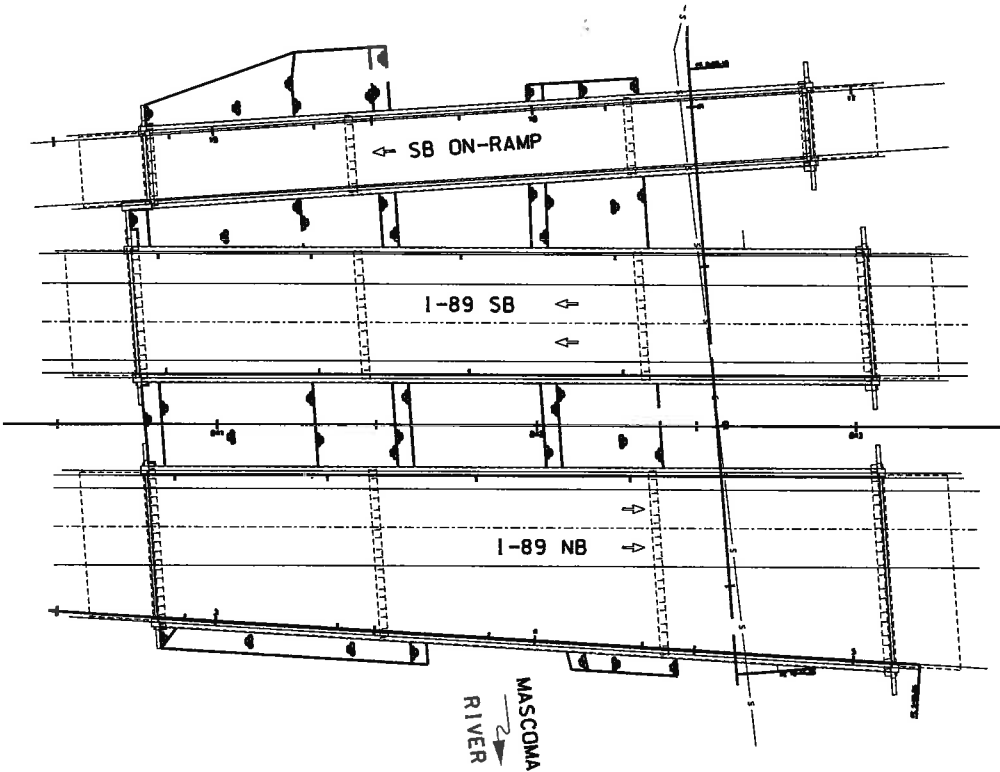
- 0 = Contractor Option
- 1 = Nonwoven (Default for Application 1 & Application 4)
- 2 = Monofilament, Woven
- 3 = Slit Filament, Woven

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION
WETLANDS PLANS
FEDERAL AID PROJECT

N.H. PROJECT NO. 27287
INTERSTATE 89 NB, SB, AND SB ON RAMP



LOCATION MAP



INDEX OF SHEETS

- 1 FRONT SHEET
- 2-3 STANDARD SYMBOLS SHEETS
- 4 WETLAND IMPACT PLAN
- 5 EROSION CONTROL STRATEGIES
- 6 EROSION CONTROL PLAN 097/112, 098/111, & 099/111
- 7 GENERAL PLAN BR NO 097/112
- 8 GENERAL PLAN BR NO 098/111
- 9 GENERAL PLAN BR NO 099/111

LEBANON

GRAFTON COUNTY

SCALE: 1" = 30'-0"

FOR CONSTRUCTION AND ALIGNMENT DETAILS - SEE CONSTRUCTION PLANS

NHDOT THE STATE OF
NEW HAMPSHIRE
DEPARTMENT OF
TRANSPORTATION

RECOMMENDED FOR APPROVAL:

DIRECTOR OF PROJECT DEVELOPMENT DATE

APPROVED:

ASSISTANT COMMISSIONER AND CHIEF ENGINEER DATE

U. S. DEPARTMENT OF
TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED:

DIVISION ADMINISTRATOR DATE

FEDERAL PROJECT NO.	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
	27287	1	9

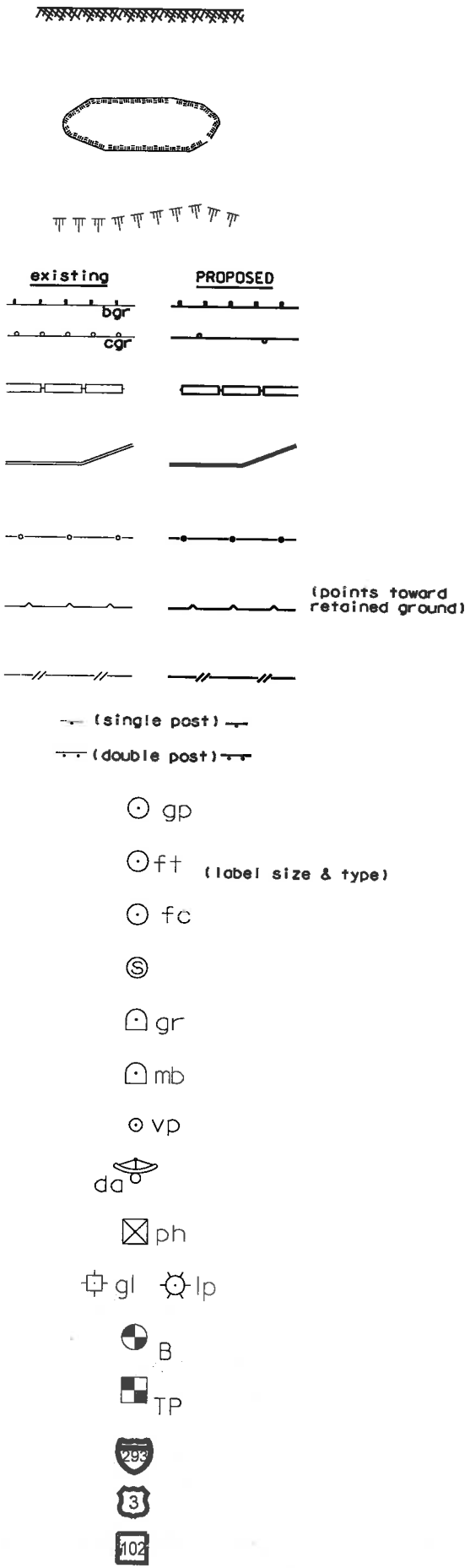
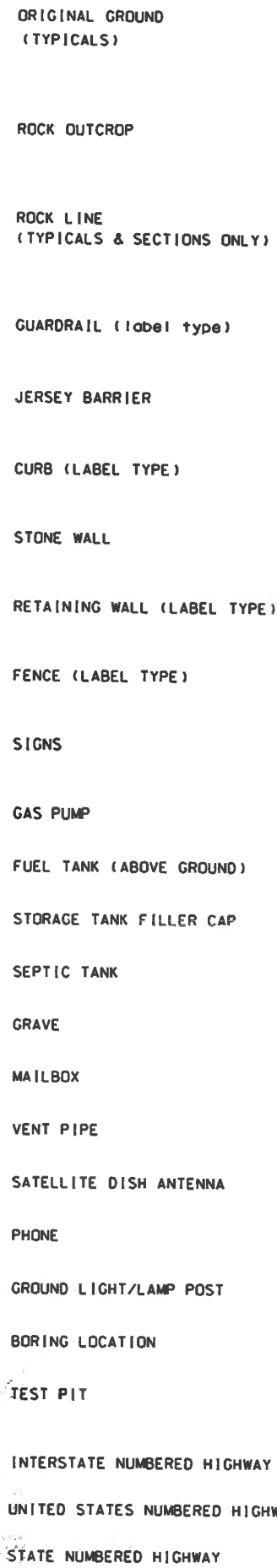
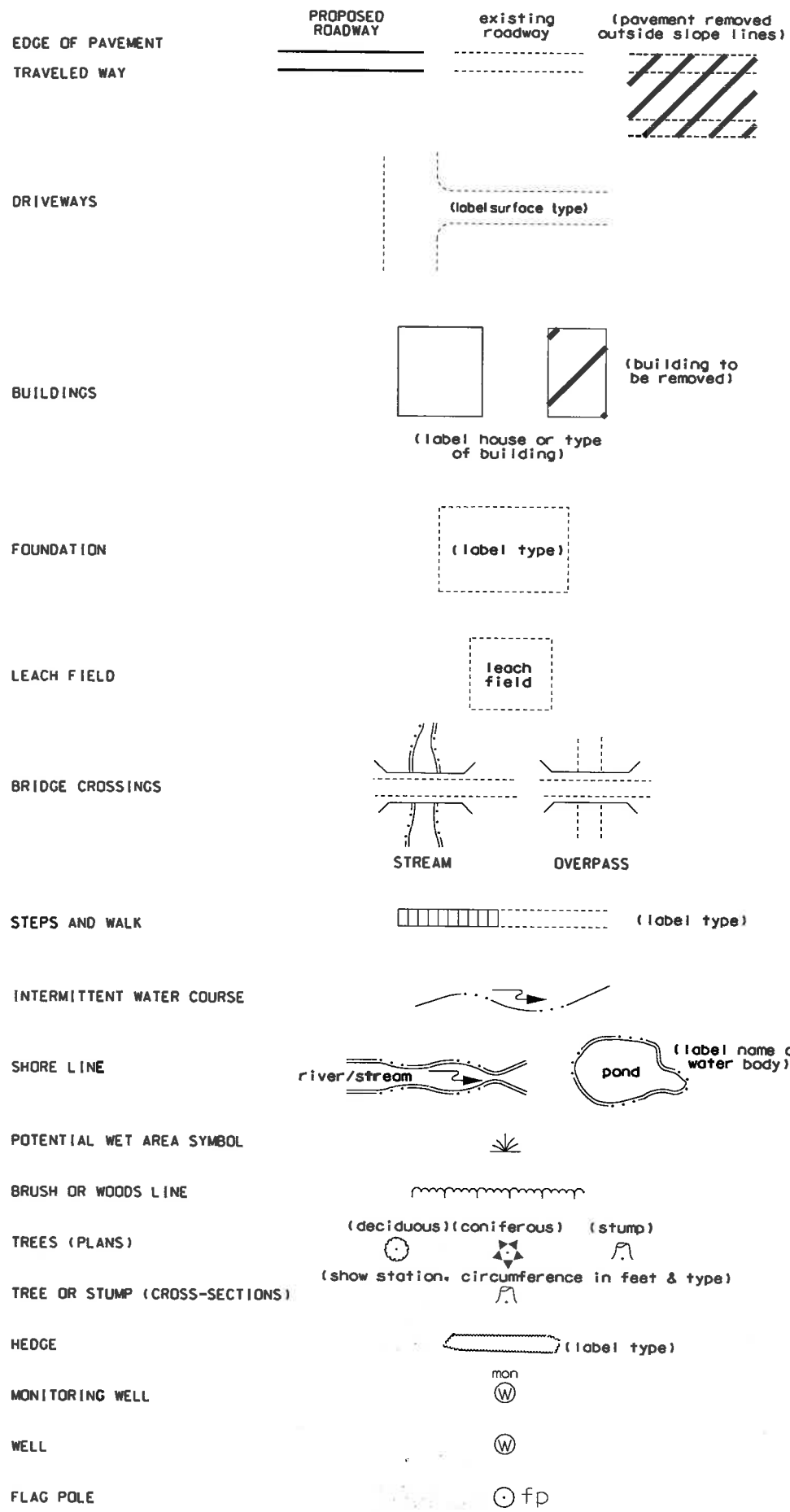
DATE 4/17

DATE 4/17

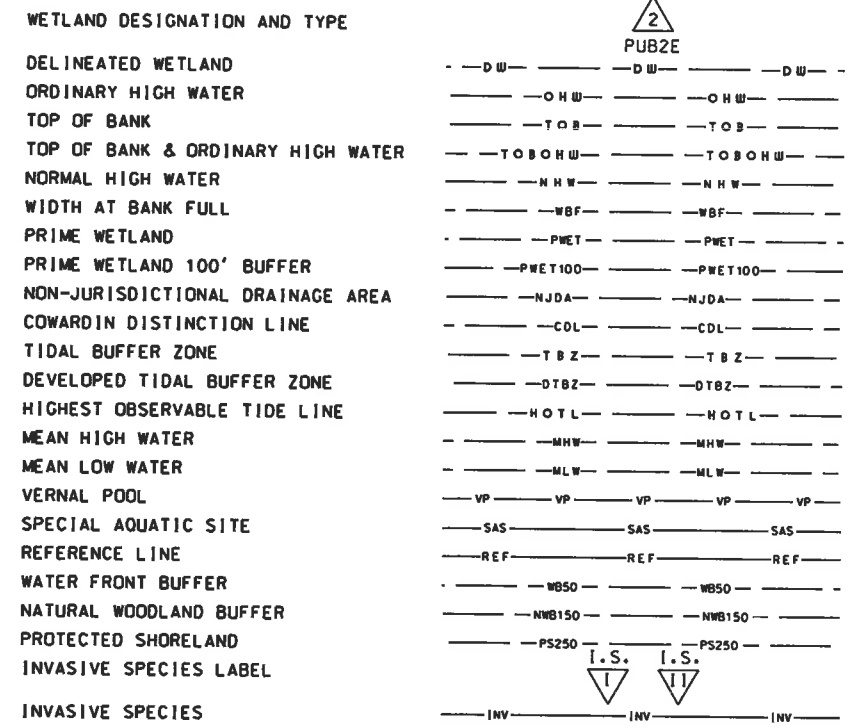
DRAWN BY: SMG

CHECKED BY: JAT

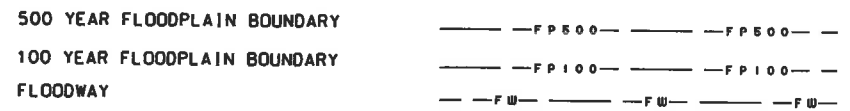
GENERAL



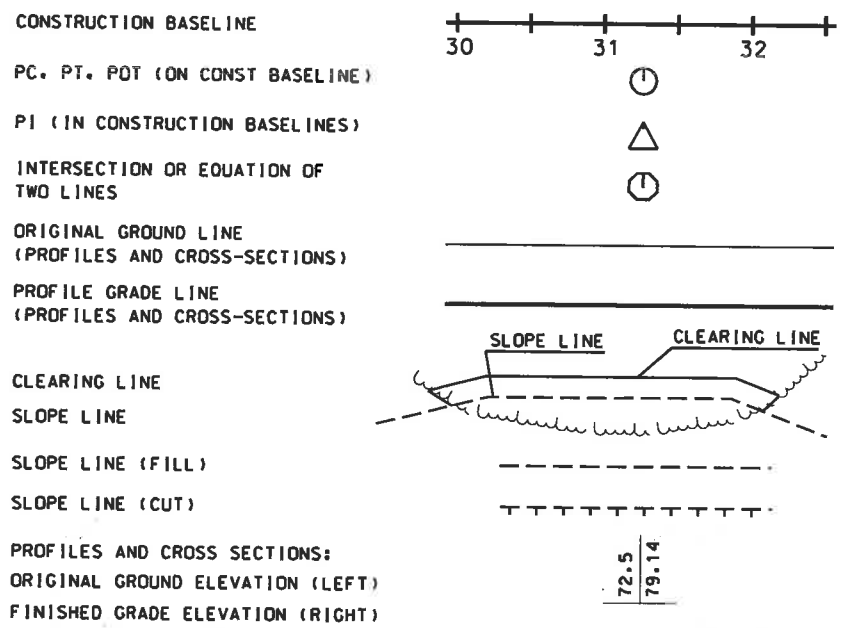
SHORELAND - WETLAND



FLOODPLAIN / FLOODWAY



ENGINEERING


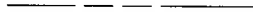




















STATE OF NEW HAMPSHIRE				
DEPARTMENT OF TRANSPORTATION • BUREAU OF HIGHWAY DESIGN				
STANDARD SYMBOLS				
REVISION DATE	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
11-21-2014	stdsyml_2	27287	2	9

DRAINAGE

MANHOLE			
CATCH BASIN		cb	(existing)
			(PROPOSED)
DROP INLET		di	(existing)
			(PROPOSED)
DRAINAGE PIPE (existing)			(label size & type)
DRAINAGE PIPE (PROPOSED)			
UNDERDRAIN (existing) W/ FLUSHING BASIN		fb	(label size & type)
UNDERDRAIN (PROPOSED) W/ FLUSHING BASIN			
HEADER (existing & PROPOSED)			(with stone outlet protection)
END SECTION (existing & PROPOSED)			METAL or PLASTIC
			RCP
OPEN DITCH (PROPOSED)			
EROSION CONTROL/ STONE SLOPE PROTECTION			

BOUNDARIES / RIGHT-OF-WAY

RIGHT-OF-WAY LINE		(label type)
RR RIGHT-OF-WAY LINE		
PROPERTY LINE		
PROPERTY LINE (COMMON OWNER)		
TOWN LINE		
COUNTY LINE		
STATE LINE		
NATIONAL FOREST		
CONSERVATION LAND		
BENCH MARK / SURVEY DISK		
BOUND	 bnd  (PROPOSED)	
STATE LINE/ TOWN LINE MONUMENT	 S/L  T/L	
NHDOT PROJECT MARKER		
IRON PIPE OR PIN	 ip	
DRILL HOLE IN ROCK	 dh	
TAX MAP AND LOT NUMBER	 1642/341 6.80 Ac.±	
PROPERTY PARCEL NUMBER		
HISTORIC PROPERTY		









UTILITIES

	existing	PROPOSED
TELEPHONE POLE		
POWER POLE		
JOINT OCCUPANCY		
MISCELLANEOUS/UNKNOWN POLE		
GUY POLE OR PUSH BRACE		
LIGHT POLE		
LIGHT ON POWER POLE		
LIGHT ON JOINT POLE		
POLE STATUS: REMOVE, LEAVE, PROPOSED, OR TEMPORARY AS APPLICABLE e.g.:		
RAILROAD		
RAILROAD SIGN		
RAILROAD SIGNAL		
UTILITY JUNCTION BOX		
OVERHEAD WIRE		
UNDERGROUND UTILITIES		
WATER (on existing lines label size, type and note if abandoned)		
SEWER		
TELEPHONE		
ELECTRIC		
GAS		
LIGHTING		
INTELLIGENT TRANSPORTATION SYSTEM		
FIBER OPTIC		
WATER SHUT OFF		
GAS SHUT OFF		
HYDRANT		
MANHOLES		
SEWER		
TELEPHONE		
ELECTRICAL		
GAS		
UNKNOWN		

TRAFFIC SIGNALS / ITS

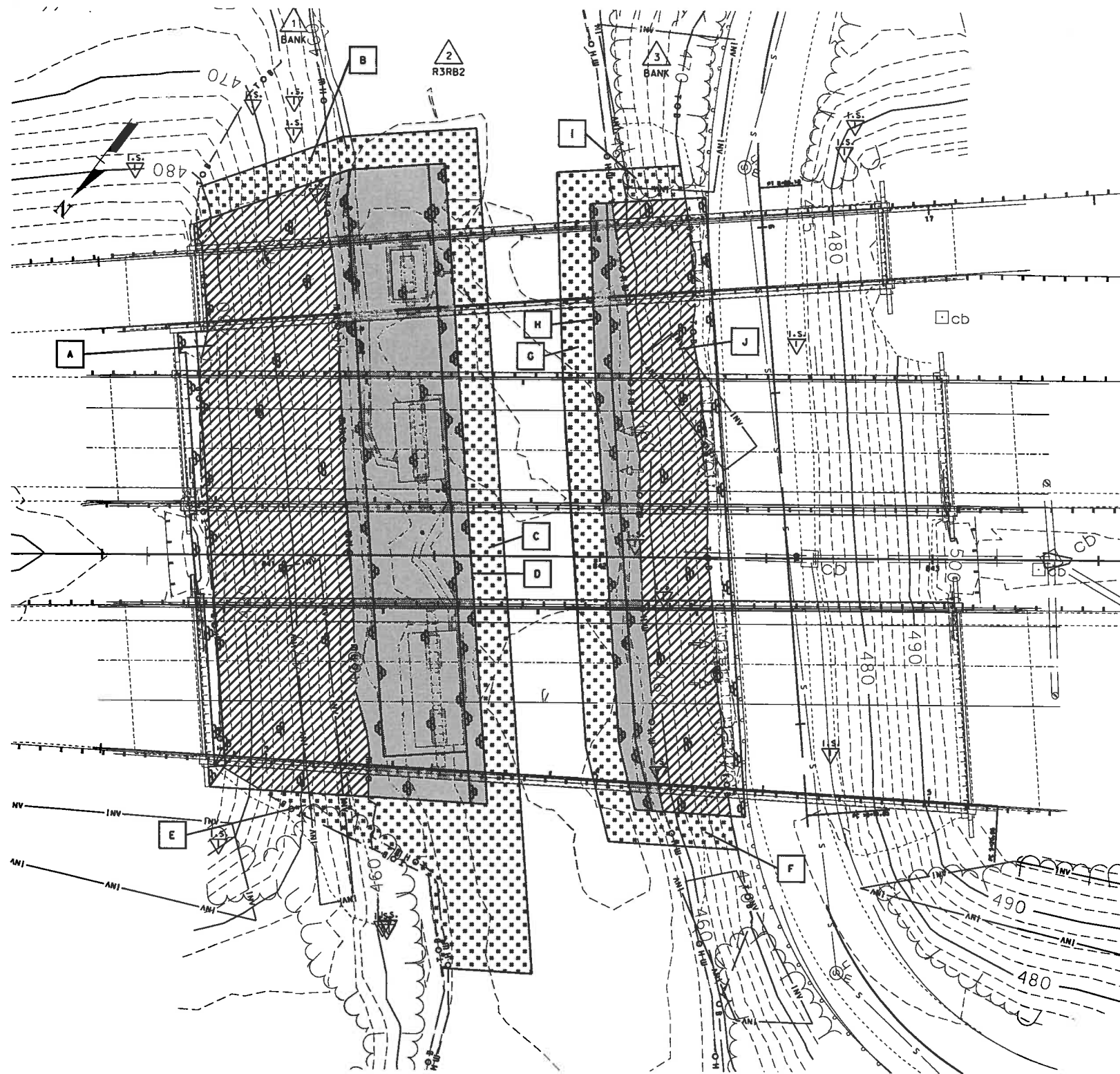
	<u>existing</u>	<u>PROPOSED</u>
MAST ARM (existing)		
OPTICOM RECEIVER		
OPTICOM STROBE		
TRAFFIC SIGNAL		
PEDESTAL WITH PEDESTRIAN SIGNAL HEADS AND PUSH BUTTON UNIT		
SIGNAL CONDUIT		
CONTROLLER CABINET		
METER PEDESTAL		
PULL BOX		
LOOP DETECTOR (QUADRUPOLE)		
LOOP DETECTOR (RECTANGULAR)		
CAMERA POLE (CCTV)		
FIBER OPTIC DELINEATOR		
FIBER OPTIC SPLICE VAULT		
ITS EQUIPMENT CABINET		
VARIABLE SPEED LIMIT SIGN		
DYNAMIC MESSAGE SIGN		
ROAD AND WEATHER INFO SYSTEM		

CONSTRUCTION NOTES

CURB MARK NUMBER - BITUMINOUS	B-1
CURB MARK NUMBER - GRANITE	G-1
CLEARING AND GRUBBING AREA	
DRAINAGE NOTE	
EROSION CONTROL NOTE	
FENCING NOTE	
GUARDRAIL NOTE	
ITS NOTE	
LIGHTING NOTE	
TRAFFIC SIGNAL NOTE	

SHEET 2 OF 2

STATE OF NEW HAMPSHIRE			
DEPARTMENT OF TRANSPORTATION • BUREAU OF HIGHWAY DESIGN			
<i>STANDARD SYMBOLS</i>			
DATE	DGN	STATE PROJECT NO.	TOTAL SHEETS
6	stdsyml.2	27287	9



BR NOS 097/112, 098/111 & 099/111 PLAN VIEW
SCALE: 1" = 20'-0"



LEGEND

TYPE OF WETLAND IMPACT	SHADING/HATCHING	#	WETLAND DESIGNATION NUMBER
NEW HAMPSHIRE WETLANDS BUREAU (PERMANENT NON-WETLAND)	[Hatched Box]	#	WETLAND IMPACT LOCATION
NEW HAMPSHIRE WETLANDS BUREAU & ARMY CORP OF ENGINEERS (PERMANENT WETLAND)	[Solid Grey Box]	#	WETLAND MITIGATION AREA
TEMPORARY IMPACTS	[Dotted Box]	[Hatched Box]	MITIGATION

WETLAND IMPACT SUMMARY											
WETLAND NUMBER	WETLAND CLASS- IFICATION	LOCATION	AREA IMPACTS						LINEAR STREAM IMPACTS FOR MITIGATION		
			PERMANENT				TEMPORARY		PERMANENT		
			N.H.W.B. (NON-WETLAND)		N.H.W.B. & A.C.O.E. (WETLAND)				BANK LEFT	BANK RIGHT	CHANNEL
			SF	LF	SF	LF					
1	BANK	A	7442	187	-	-	-	-	-	187	-
1	BANK	B	-	-	-	-	420	11	-	-	-
2	R3RB2	C	-	-	-	-	4016	256	-	-	-
2	R3RB2	D	-	-	6842	194	-	-	-	-	194
1	BANK	E	-	-	-	-	390	57	-	-	-
3	BANK	F	-	-	-	-	193	11	-	-	-
2	R3RB2	G	-	-	-	-	2186	203	-	-	-
2	R3RB2	H	-	-	1833	183	-	-	-	-	183
3	BANK	I	-	-	-	-	218	11	-	-	-
3	BANK	J	3816	184	-	-	-	-	184	-	-
TOTAL			11258	371	8675	377	7423	549	184	187	377

PERMANENT IMPACTS: 19933 SF
TEMPORARY IMPACTS: 7423 SF
TOTAL IMPACTS: 27356 SF

WETLAND CLASSIFICATION CODES

BANK	BANK
R3RB2	RIVERINE UPPER PERENNIAL ROCK RUBBLE

WETLAND DELINEATION BY CHRISTOPHER C. DORION, CERTIFIED WETLAND SCIENTIST NO. 251, OF C.C. DORION GEOLOGICAL SERVICES, LLC. DELINEATION OCCURRED ON NOVEMBER 30 AND DECEMBER 12, 2016.

STATE OF NEW HAMPSHIRE																				
DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN																				
TOWN LEBANON			BRIDGE NO. 097/112			STATE PROJECT 27287														
LOCATION 1-89 NB over TRUCK RD & MASCOMA RIVER																				
WETLAND IMPACT PLAN 097/112, 098/111 & 099/111																				
DESIGNED				BY	DATE	CHECKED				BY	DATE									
DRAWN				JAT	4/17	BOENV				JAT	4/17									
QUANTITIES				SMG	4/17	CHECKED				JAT	4/17									
ISSUE DATE				FEDERAL PROJECT NO.				SHEET NO.												
REV. DATE								4												
SUBDIRECTORY			DGN LOCATOR			SHEET SCALE			BRIDGE SHEET											
BRO/CONTRACT #1			097-112 wetland			AS NOTED			OF											
									FILE NUMBER											

EROSION CONTROL STRATEGIES

1. ENVIRONMENTAL COMMITMENTS:
- 1.1. THESE GUIDELINES DO NOT RELIEVE THE CONTRACTOR FROM COMPLIANCE WITH ANY CONTRACT PROVISIONS, OR APPLICABLE FEDERAL, STATE, AND LOCAL REGULATIONS.
- 1.2. THIS PROJECT WILL BE SUBJECT TO THE US EPA'S NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) STORM WATER CONSTRUCTION GENERAL PERMIT AS ADMINISTERED BY THE ENVIRONMENTAL PROTECTION AGENCY (EPA). THIS PROJECT IS SUBJECT TO REQUIREMENTS IN THE MOST RECENT CONSTRUCTION GENERAL PERMIT (CGP).
- 1.3. THE CONTRACTOR'S ATTENTION IS DIRECTED TO THE NHDES WETLAND PERMIT, THE US ARMY CORPS OF ENGINEERS PERMIT, WATER QUALITY CERTIFICATION AND THE SPECIAL ATTENTION ITEMS INCLUDED IN THE CONTRACT DOCUMENTS.
- 1.4. ALL STORM WATER, EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH THE NEW HAMPSHIRE STORMWATER MANUAL, VOLUME 3, EROSION AND SEDIMENT CONTROLS DURING CONSTRUCTION (DECEMBER 2008) (BMP MANUAL) AVAILABLE FROM THE NEW HAMPSHIRE DEPARTMENT OF ENVIRONMENTAL SERVICES (NHDES).
- 1.5. THE CONTRACTOR SHALL COMPLY WITH RSA 485-A:17, AND ALL, PUBLISHED NHDES ALTERATION OF TERRAIN ENV-WO 1500 REQUIREMENTS ([HTTP://DES.NH.GOV/ORGANIZATION/COMMISSIONER/LEGAL/RULES/INDEX.HTM](http://DES.NH.GOV/ORGANIZATION/COMMISSIONER/LEGAL/RULES/INDEX.HTM))
- 1.6. THE CONTRACTOR IS DIRECTED TO REVIEW AND COMPLY WITH SECTION 107.1 OF THE CONTRACT AS IT REFERS TO SPILLAGE, AND ALSO WITH REGARDS TO EROSION, POLLUTION, AND TURBIDITY PRECAUTIONS.
2. STANDARD EROSION CONTROL SEQUENCING APPLICABLE TO ALL CONSTRUCTION PROJECTS:
- 2.1. PERIMETER CONTROLS SHALL BE INSTALLED PRIOR TO EARTH DISTURBING ACTIVITIES. PERIMETER CONTROLS AND STABILIZED CONSTRUCTION EXITS SHALL BE INSTALLED AS SHOWN IN THE BMP MANUAL AND AS DIRECTED BY THE STORMWATER POLLUTION PREVENTION PLAN (SWPPP) PREPARER.
- 2.2. EROSION, SEDIMENTATION CONTROL MEASURES AND INFILTRATION BASINS SHALL BE CLEANED, REPLACED AND AUGMENTED AS NECESSARY TO PREVENT SEDIMENTATION BEYOND PROJECT LIMITS THROUGHOUT THE PROJECT DURATION.
- 2.3. EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSPECTED IN ACCORDANCE WITH THE CONSTRUCTION GENERAL PERMIT AND SECTION 645 OF THE NHDOT SPECIFICATIONS FOR ROAD AND BRIDGES CONSTRUCTION.
- 2.4. AN AREA SHALL BE CONSIDERED STABLE IF ONE OF THE FOLLOWING HAS OCCURRED:
- (A) BASE COURSE GRAVELS HAVE BEEN INSTALLED IN AREAS TO BE PAVED;
- (B) A MINIMUM OF 85% VEGETATED GROWTH HAS BEEN ESTABLISHED;
- (C) A MINIMUM OF 3" OF NON-EROSIVE MATERIAL SUCH AS STONE OR RIP-RAP HAS BEEN INSTALLED;
- (D) TEMPORARY SLOPE STABILIZATION CONFORMING TO TABLE 1 HAS BEEN PROPERLY INSTALLED
- 2.5. ALL STOCKPILES SHALL BE CONTAINED WITH A PERIMETER CONTROL. IF THE STOCKPILE IS TO REMAIN UNDISTURBED FOR MORE THAN 14 DAYS, MULCHING WILL BE REQUIRED.
- 2.6. A WATER TRUCK SHALL BE AVAILABLE TO CONTROL EXCESSIVE DUST AT THE DIRECTION OF THE CONTRACT ADMINISTRATOR.
- 2.7. TEMPORARY EROSION AND SEDIMENTATION CONTROL MEASURES SHALL REMAIN UNTIL THE AREA HAS BEEN PERMANENTLY STABILIZED.
- 2.8. CONSTRUCTION PERFORMED ANY TIME BETWEEN NOVEMBER 30th AND MAY 1st OF ANY YEAR SHALL BE CONSIDERED WINTER CONSTRUCTION AND SHALL CONFORM TO THE FOLLOWING REQUIREMENTS.
- (A) ALL PROPOSED VEGETATED AREAS WHICH DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15th, OR WHICH ARE DISTURBED AFTER OCTOBER 15th, SHALL BE STABILIZED IN ACCORDANCE WITH TABLE 1.
- (B) ALL DITCHES OR SWALES WHICH DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15th, OR WHICH ARE DISTURBED AFTER OCTOBER 15th, SHALL BE STABILIZED TEMPORARILY WITH STONE OR IN ACCORDANCE WITH TABLE 1.
- (C) AFTER NOVEMBER 30th INCOMPLETE ROAD SURFACES, WHERE WORK HAS STOPPED FOR THE SEASON, SHALL BE PROTECTED IN ACCORDANCE WITH TABLE 1.
- (D) WINTER EXCAVATION AND EARTHWORK SHALL BE DONE SUCH THAT NO MORE THAN 1 ACRE OF THE PROJECT IS WITHOUT STABILIZATION AT ONE TIME, UNLESS A WINTER CONSTRUCTION PLAN HAS BEEN APPROVED BY NHDOT THAT MEETS THE REQUIREMENTS OF ENV-WO 1505.02 AND ENV-WO 1505.05.
- (E) A SWPPP AMENDMENT SHALL BE SUBMITTED TO THE DEPARTMENT, FOR APPROVAL, ADDRESSING COLD WEATHER STABILIZATION (ENV-WO 1505.05) AND INCLUDING THE REQUIREMENTS OF NO LESS THAN 30 DAYS PRIOR TO THE COMMENCEMENT OF WORK SCHEDULED AFTER NOVEMBER 30th.
- GENERAL CONSTRUCTION PLANNING AND SELECTION OF STRATEGIES TO CONTROL EROSION AND SEDIMENT ON HIGHWAY CONSTRUCTION PROJECTS
3. PLAN ACTIVITIES TO ACCOUNT FOR SENSITIVE SITE CONDITIONS:
- 3.1. CLEARLY FLAG AREAS TO BE PROTECTED IN THE FIELD AND PROVIDE CONSTRUCTION BARRIERS TO PREVENT TRAFFICKING OUTSIDE OF WORK AREAS.
- 3.2. CONSTRUCTION SHALL BE SEQUENCED TO LIMIT THE DURATION AND AREA OF EXPOSED SOILS.
- 3.3. PROTECT AND MAXIMIZE EXISTING NATIVE VEGETATION AND NATURAL FOREST BUFFERS BETWEEN CONSTRUCTION ACTIVITY AND SENSITIVE AREAS.
- 3.4. WHEN WORK IS PERFORMED IN AND NEAR WATER COURSES, STREAM FLOW DIVERSION METHODS SHALL BE IMPLEMENTED PRIOR TO ANY EXCAVATION OR FILLING.
- 3.5. WHEN WORK IS PERFORMED WITHIN 50 FEET OF SURFACE WATERS (WETLAND, OPEN WATER OR FLOWING WATER), PERIMETER CONTROL SHALL BE ENHANCED CONSISTENT WITH SECTION 2.1.2.1. OF THE 2012 NPDES CONSTRUCTION GENERAL PERMIT.
4. MINIMIZE THE AMOUNT OF EXPOSED SOIL:
- 4.1. CONSTRUCTION SHALL BE SEQUENCED TO LIMIT THE DURATION AND AREA OF EXPOSED SOILS. MINIMIZE THE AREA OF EXPOSED SOIL AT ANY ONE TIME. PHASING SHALL BE USED TO REDUCE THE AMOUNT AND DURATION OF SOIL EXPOSED TO THE ELEMENTS AND VEHICLE TRACKING.
- 4.2. UTILIZE TEMPORARY MULCHING OR PROVIDE ALTERNATE TEMPORARY STABILIZATION ON EXPOSED SOILS IN ACCORDANCE WITH TABLE 1.
- 4.3. THE MAXIMUM AMOUNT OF DISTURBED EARTH SHALL NOT EXCEED A TOTAL OF 5 ACRES FROM MAY 1st THROUGH NOVEMBER 30th, OR EXCEED ONE ACRE DURING WINTER MONTHS, UNLESS THE CONTRACTOR DEMONSTRATES TO THE DEPARTMENT THAT THE ADDITIONAL AREA OF DISTURBANCE IS NECESSARY TO MEET THE CONTRACTORS CRITICAL PATH METHOD SCHEDULE (CPM), AND THE CONTRACTOR HAS ADEQUATE RESOURCES AVAILABLE TO ENSURE THAT ENVIRONMENTAL COMMITMENTS WILL BE MET.
5. CONTROL STORMWATER FLOWING ONTO AND THROUGH THE PROJECT:
- 5.1. DIVERT OFF SITE RUNOFF OR CLEAN WATER AWAY FROM THE CONSTRUCTION ACTIVITY TO REDUCE THE VOLUME THAT NEEDS TO BE TREATED ON SITE.
- 5.2. DIVERT STORM RUNOFF FROM UPSLOPE DRAINAGE AREAS AWAY FROM DISTURBED AREAS, SLOPES, AND AROUND ACTIVE WORK AREAS AND TO A STABILIZED OUTLET LOCATION.
- 5.3. CONSTRUCT IMPERMEABLE BARRIERS AS NECESSARY TO COLLECT OR DIVERT CONCENTRATED FLOWS FROM WORK OR DISTURBED AREAS.
- 5.4. STABILIZE, TO APPROPRIATE ANTICIPATED VELOCITIES, CONVEYANCE CHANNELS OR PUMPING SYSTEMS NEEDED TO CONVEY CONSTRUCTION STORMWATER TO BASINS AND DISCHARGE LOCATIONS PRIOR TO USE.
- 5.5. DIVERT OFF-SITE WATER THROUGH THE PROJECT IN AN APPROPRIATE MANNER SO NOT TO DISTURB THE UPSTREAM OR DOWNSTREAM SOILS, VEGETATION OR HYDROLOGY BEYOND THE PERMITTED AREA.
6. PROTECT SLOPES:
- 6.1. INTERCEPT AND DIVERT STORM RUNOFF FROM UPSLOPE DRAINAGE AREAS AWAY FROM UNPROTECTED AND NEWLY ESTABLISHED AREAS AND SLOPES TO A STABILIZED OUTLET OR CONVEYANCE.
- 6.2. CONSIDER HOW GROUNDWATER SEEPAGE ON CUT SLOPES MAY IMPACT SLOPE STABILITY AND INCORPORATE APPROPRIATE MEASURES TO MINIMIZE EROSION.
- 6.3. CONVEY STORMWATER DOWN THE SLOPE IN A STABILIZED CHANNEL OR SLOPE DRAIN.
- 6.4. THE OUTER FACE OF THE FILL SLOPE SHOULD BE IN A LOOSE RUFFLED CONDITION PRIOR TO TURF ESTABLISHMENT. TOPSOIL OR HUMUS LAYERS SHALL BE TRACKED UP AND DOWN THE SLOPE, DISKED, HARROWED, DRAGGED WITH A CHAIN OR MAT, MACHINE-RAKED, OR HAND-WORKED TO PRODUCE A RUFFLED SURFACE.
7. ESTABLISH STABILIZED CONSTRUCTION EXITS:
- 7.1. INSTALL AND MAINTAIN CONSTRUCTION EXITS, ANYWHERE TRAFFIC LEAVES A CONSTRUCTION SITE ONTO A PUBLIC RIGHT-OF-WAY.
- 7.2. SWEEP ALL CONSTRUCTION RELATED DEBRIS AND SOIL FROM THE ADJACENT PAVED ROADWAYS AS NECESSARY.
8. PROTECT STORM DRAIN INLETS:
- 8.1. DIVERT SEDIMENT LOADED WATER AWAY FROM INLET STRUCTURES TO THE EXTENT POSSIBLE.
- 8.2. INSTALL SEDIMENT BARRIERS AND SEDIMENT TRAPS AT INLETS TO PREVENT SEDIMENT FROM ENTERING THE DRAINAGE SYSTEM.
- 8.3. CLEAN CATCH BASINS, DRAINAGE PIPES, AND CULVERTS IF SIGNIFICANT SEDIMENT IS DEPOSITED.
- 8.4. DROP INLET SEDIMENT BARRIERS SHOULD NEVER BE USED AS THE PRIMARY MEANS OF SEDIMENT CONTROL AND SHOULD ONLY BE USED TO PROVIDE AN ADDITIONAL LEVEL OF PROTECTION TO STRUCTURES AND DOWN-GRADIENT SENSITIVE RECEPTORS.
9. SOIL STABILIZATION:
- 9.1. WITHIN THREE DAYS OF THE LAST ACTIVITY IN AN AREA, ALL EXPOSED SOIL AREAS, WHERE CONSTRUCTION ACTIVITIES ARE COMPLETE, SHALL BE STABILIZED.
- 9.2. IN ALL AREAS, TEMPORARY SOIL STABILIZATION MEASURES SHALL BE APPLIED IN ACCORDANCE WITH THE STABILIZATION REQUIREMENTS (SECTION 2.2) OF THE 2012 CGP. (SEE TABLE 1 FOR GUIDANCE ON THE SELECTION OF TEMPORARY SOIL STABILIZATION MEASURES.)
- 9.3. EROSION CONTROL SEED MIX SHALL BE SOWN IN ALL INACTIVE CONSTRUCTION AREAS THAT WILL NOT BE PERMANENTLY SEEDED WITHIN TWO WEEKS OF DISTURBANCE AND PRIOR TO SEPTEMBER 15, OF ANY GIVEN YEAR, IN ORDER TO ACHIEVE VEGETATIVE STABILIZATION PRIOR TO THE END OF THE GROWING SEASON.
- 9.4. SOIL TACKIFIERS MAY BE APPLIED IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS AND REAPPLIED AS NECESSARY TO MINIMIZE SOIL AND MULCH LOSS UNTIL PERMANENT VEGETATION IS ESTABLISHED.
10. RETAIN SEDIMENT ON-SITE AND CONTROL DEWATERING PRACTICES:
- 10.1. TEMPORARY SEDIMENT BASINS (CGP-SECTION 2.1.3.2) OR SEDIMENT TRAPS (ENV-WO 1506.10) SHALL BE SIZED TO RETAIN, ON SITE, THE VOLUME OF A 2-YEAR 24-HOUR STORM EVENT FOR ANY AREA OF DISTURBANCE OR 3,600 CUBIC FEET OF STORMWATER RUNOFF PER ACRE OF DISTURBANCE, WHICHEVER IS GREATER. TEMPORARY SEDIMENT BASINS USED TO TREAT STORMWATER RUNOFF FROM AREAS GREATER THAN 5-ACRES OF DISTURBANCE SHALL BE SIZED TO ALSO CONTROL STORMWATER RUNOFF FROM A 10-YEAR 24 HOUR STORM EVENT. ON-SITE RETENTION OF THE 10-YEAR 24-HOUR EVENT IS NOT REQUIRED.
- 10.2. CONSTRUCT AND STABILIZE DEWATERING INFILTRATION BASINS PRIOR TO ANY EXCAVATION THAT MAY REQUIRE DEWATERING.
- 10.3. TEMPORARY SEDIMENT BASINS OR TRAPS SHALL BE PLACED AND STABILIZED AT LOCATIONS WHERE CONCENTRATED FLOW (CHANNELS AND PIPES) DISCHARGE TO THE SURROUNDING ENVIRONMENT FROM AREAS OF UNSTABILIZED EARTH DISTURBING ACTIVITIES.

11. ADDITIONAL EROSION AND SEDIMENT CONTROL GENERAL PRACTICES:
- 11.1. USE TEMPORARY MULCHING, PERMANENT MULCHING, TEMPORARY VEGETATIVE COVER, AND PERMANENT VEGETATIVE COVER TO REDUCE THE NEED FOR DUST CONTROL. USE MECHANICAL SWEEPERS ON PAVED SURFACES WHERE NECESSARY TO PREVENT DUST BUILDUP. APPLY WATER, OR OTHER DUST INHIBITING AGENTS OR TACKIFIERS, AS APPROVED BY THE NHDES.
- 11.2. ALL STOCKPILES SHALL BE CONTAINED WITH TEMPORARY PERIMETER CONTROLS. INACTIVE SOIL STOCKPILES SHOULD BE PROTECTED WITH SOIL STABILIZATION MEASURES (TEMPORARY EROSION CONTROL SEED MIX AND MULCH, SOIL BINDER) OR COVERED WITH ANCHORED TARPS.
- 11.3. EROSION AND SEDIMENT CONTROL MEASURES WILL BE INSPECTED IN ACCORDANCE WITH SECTION 645 OF NHDOT SPECIFICATIONS, WEEKLY AND WITHIN 24 HOURS AFTER ANY STORM EVENT GREATER THAN 0.25 IN. OF RAIN PER 24-HOUR PERIOD. EROSION AND SEDIMENT CONTROL MEASURES WILL ALSO BE INSPECTED IN ACCORDANCE WITH THE GUIDANCE MEMO FROM THE NHDES CONTAINED WITHIN THE CONTRACT PROPOSAL AND THE EPA CONSTRUCTION GENERAL PERMIT.
- 11.4. THE CONTRACTOR SHOULD UTILIZE STORM DRAIN INLET PROTECTION TO PREVENT SEDIMENT FROM ENTERING A STORM DRAINAGE SYSTEM PRIOR TO THE PERMANENT STABILIZATION OF THE CONTRIBUTING DISTURBED AREA.
- 11.5. PERMANENT STABILIZATION MEASURES WILL BE CONSTRUCTED AND MAINTAINED IN LOCATIONS AS SHOWN ON THE CONSTRUCTION PLANS TO STABILIZE AREAS. VEGETATIVE STABILIZATION SHALL NOT BE CONSIDERED PERMANENTLY STABILIZED UNTIL VEGETATIVE GROWTH COVERS AT LEAST 85% OF THE DISTURBED AREA. THE CONTRACTOR SHALL BE RESPONSIBLE FOR EROSION AND SEDIMENT CONTROL FOR ONE YEAR AFTER PROJECT COMPLETION.
- 11.6. CATCH BASINS: CARE SHALL BE TAKEN TO ENSURE THAT SEDIMENTS DO NOT ENTER ANY EXISTING CATCH BASINS DURING CONSTRUCTION. THE CONTRACTOR SHALL PLACE TEMPORARY STONE INLET PROTECTION OVER INLETS IN AREAS OF SOIL DISTURBANCE THAT ARE SUBJECT TO SEDIMENT CONTAMINATION.
- 11.7. TEMPORARY AND PERMANENT DITCHES SHALL BE CONSTRUCTED, STABILIZED AND MAINTAINED IN A MANNER THAT WILL MINIMIZE SCOUR. TEMPORARY AND PERMANENT DITCHES SHALL BE DIRECTED TO DRAIN TO SEDIMENT BASINS OR STORM WATER COLLECTION AREAS.
- 11.8. WINTER EXCAVATION AND EARTHWORK ACTIVITIES NEED TO BE LIMITED IN EXTENT AND DURATION, TO MINIMIZE POTENTIAL EROSION AND SEDIMENTATION IMPACTS. THE AREA OF EXPOSED SOIL SHALL BE LIMITED TO ONE ACRE, OR THAT WHICH CAN BE STABILIZED AT THE END OF EACH DAY UNLESS A WINTER CONSTRUCTION PLAN, DEVELOPED BY A QUALIFIED ENGINEER OR A CPESC SPECIALIST, IS REVIEWED AND APPROVED BY THE DEPARTMENT.
- 11.9. CHANNEL PROTECTION MEASURES SHALL BE SUPPLEMENTED WITH PERIMETER CONTROL MEASURES WHEN THE DITCH LINES OCCUR AT THE BOTTOM OF LONG FILL SLOPES. THE PERIMETER CONTROLS SHALL BE INSTALLED ON THE FILL SLOPE TO MINIMIZE THE POTENTIAL FOR FILL SLOPE SEDIMENT DEPOSITS IN THE DITCH LINE.

BEST MANAGEMENT PRACTICES (BMP) BASED ON AMOUNT OF OPEN CONSTRUCTION AREA

12. STRATEGIES SPECIFIC TO OPEN AREAS LESS THAN 5 ACRES:
- 12.1. THE CONTRACTOR SHALL COMPLY WITH RSA 485-A:17 AND ENV-WO 1500: ALTERATION OF TERRAIN FOR CONSTRUCTION AND USE ALL CONVENTIONAL BMP STRATEGIES.
- 12.2. SLOPES STEEPER THAN 3:1 WILL RECEIVE TURF ESTABLISHMENT WITH MATTING.
- 12.3. SLOPES 3:1 OR FLATTER WILL RECEIVE TURF ESTABLISHMENT ALONE.
- 12.4. AREAS WHERE HAUL ROADS ARE CONSTRUCTED AND STORMWATER CANNOT BE TREATED THE DEPARTMENT WILL CONSIDER INFILTRATION.
- 12.5. FOR HAUL ROADS ADJACENT TO SENSITIVE ENVIRONMENTAL AREAS OR STEEPER THAN 5%, THE DEPARTMENT WILL CONSIDER USING EROSION STONE, CRUSHED GRAVEL, OR CRUSHED STONE BASE TO HELP MINIMIZE EROSION ISSUES.
- 12.6. ALL AREAS THAT CAN BE STABILIZED SHALL BE STABILIZED PRIOR TO OPENING UP NEW TERRITORY.
- 12.7. DETENTION BASINS SHALL BE DESIGNED AND CONSTRUCTED TO ACCOMMODATE A 2 YEAR STORM EVENT.
13. STRATEGIES SPECIFIC TO OPEN AREAS BETWEEN 5 AND 10 ACRES:
- 13.1. THE CONTRACTOR SHALL COMPLY WITH RSA 485-A:17 AND ENV-WO 1500 ALTERATION OF TERRAIN AND SHALL USE CONVENTIONAL BMP STRATEGIES AND ALL TREATMENT OPTIONS USED FOR UNDER 5 ACRES WILL BE UTILIZED.
- 13.2. DETENTION BASINS WILL BE CONSTRUCTED TO ACCOMMODATE THE 2-YEAR 24-HOUR STORM EVENT AND CONTROL A 10-YEAR 24-HOUR STORM EVENT.
- 13.3. SLOPES STEEPER THAN A 3:1 WILL RECEIVE TURF ESTABLISHMENT WITH MATTING OR OTHER TEMPORARY SOIL STABILIZATION MEASURES DETAILED IN TABLE 1. THE CONTRACTOR MAY ALSO CONSIDER A SOIL BINDER IN ACCORDANCE WITH THE NHDES APPROVALS OR REGULATIONS. OTHER ALTERNATIVE MEASURES, SUCH AS BONDED FIBER MATRIXES (BFMS) OR FLEXIBLE GROWTH MEDIUMS (FGMS) MAY BE UTILIZED, IF MEETING THE NHDES APPROVALS AND REGULATIONS.
- 13.4. SLOPES 3:1 OR FLATTER WILL RECEIVE TURF ESTABLISHMENT OR OTHER TEMPORARY SOIL STABILIZATION MEASURES DETAILED IN TABLE 1. THE CONTRACTOR MAY ALSO CONSIDER A SOIL BINDER IN ACCORDANCE WITH THE NHDES APPROVALS OR REGULATIONS.
14. STRATEGIES SPECIFIC TO OPEN AREAS OVER 10 ACRES:
- 14.1. THE CONTRACTOR SHALL COMPLY WITH RSA 485-A:17 AND ENV-WO 1500 ALTERATION OF TERRAIN AND SHALL USE CONVENTIONAL BMP STRATEGIES AND ALL TREATMENT OPTIONS USED FOR UNDER 5 ACRES AND BETWEEN 5 AND 10 ACRES WILL BE UTILIZED.
- 14.2. THE DEPARTMENT ANTICIPATES THAT SOIL BINDERS WILL BE NEEDED ON ALL SLOPES STEEPER THAN 3:1, IN ORDER TO MINIMIZE EROSION AND REDUCE THE AMOUNT OF SEDIMENT IN THE STORMWATER TREATMENT BASINS.
- 14.3. THE CONTRACTOR WILL BE REQUIRED TO HAVE AN APPROVED DESIGN IN ACCORDANCE WITH ENV-WO 1506.12 FOR AN ACTIVE FLOCCULANT TREATMENT SYSTEM TO TREAT AND RELEASE WATER CAPTURED IN STORM WATER BASINS. THE CONTRACTOR SHALL ALSO RETAIN THE SERVICES OF AN ENVIRONMENTAL CONSULTANT WHO HAS DEMONSTRATED EXPERIENCE IN THE DESIGN OF FLOCCULANT TREATMENT SYSTEMS. THE CONSULTANT WILL ALSO BE RESPONSIBLE FOR THE IMPLEMENTATION AND MONITORING OF THE SYSTEM.

TABLE 1
GUIDANCE ON SELECTING TEMPORARY SOIL STABILIZATION MEASURES

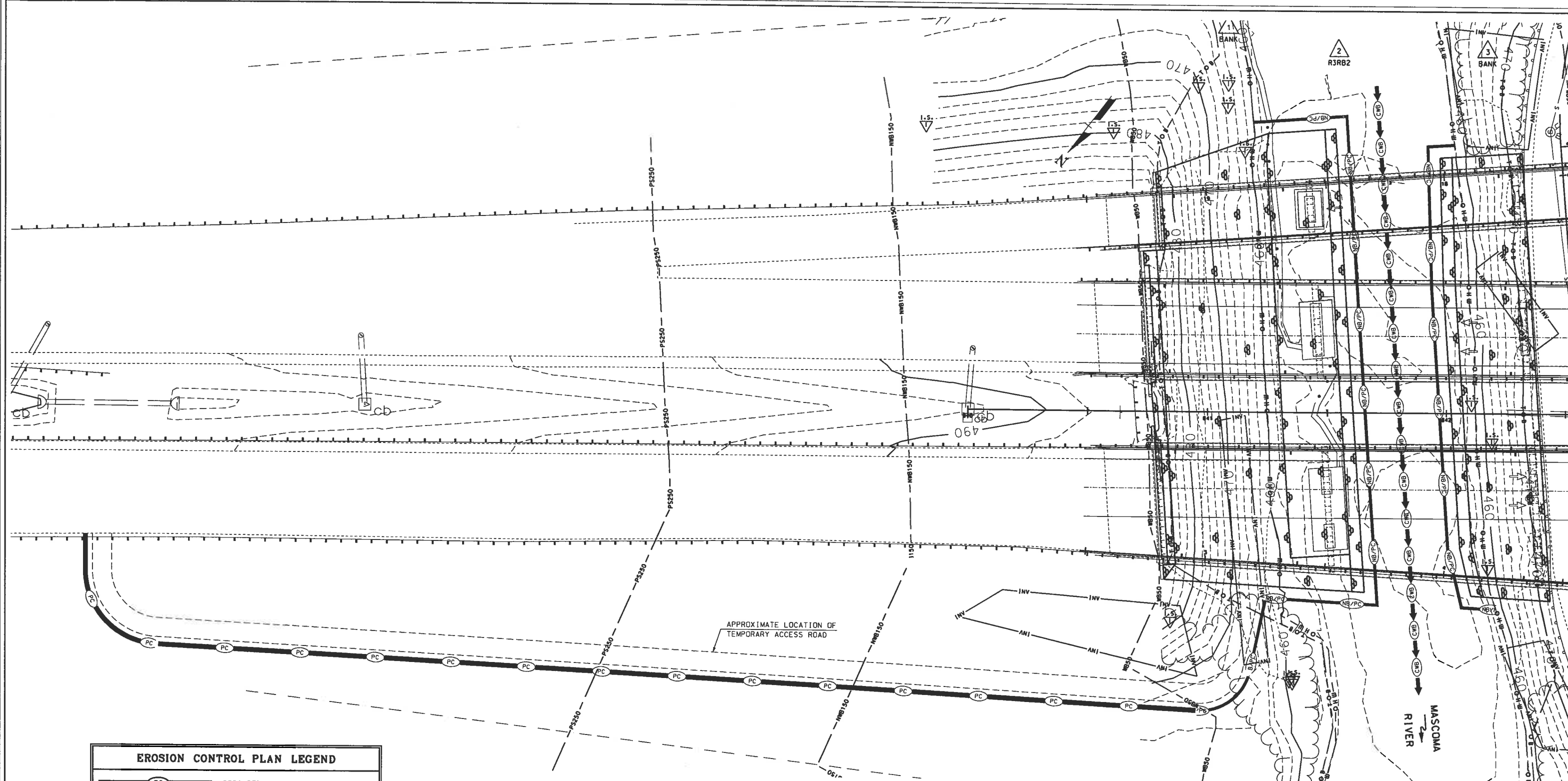
APPLICATION AREAS	DRY MULCH METHODS				HYDRAULICALLY APPLIED MULCHES ²				ROLLED EROSION CONTROL BLANKETS ³			
	HMT	WC	SG	CB	HM	SMM	BFM	FRM	SNSB	ONSB	DNCSB	DNCS
SLOPES ¹												
STEEPER THAN 2:1	NO	NO	YES	NO	NO	NO	NO	YES	NO	NO	NO	YES
2:1 SLOPE	YES ¹	YES ¹	YES	YES	NO	NO	YES	YES	NO	YES	YES	YES
3:1 SLOPE	YES	YES	YES	YES	NO	YES	YES	YES	YES	YES	YES	NO
4:1 SLOPE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	NO	NO
WINTER STABILIZATION	4T/AC	YES	YES	YES	NO	NO	YES	YES	YES	YES	YES	YES
CHANNELS												
LOW FLOW CHANNELS	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	YES
HIGH FLOW CHANNELS	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES

ABBREV.	STABILIZATION MEASURE	ABBREV.	STABILIZATION MEASURE	ABBREV.	STABILIZATION MEASURE
HMT	HAY MULCH & TACK	HM	HYDRAULIC MULCH	SNSB	SINGLE NET STRAW BLANKET
WC	WOOD CHIPS	SMM	STABILIZED MULCH MATRIX	ONSB	DOUBLE NET STRAW BLANKET
SG	STUMP GRINDINGS	BFM	BONDED FIBER MATRIX	DNCSB	2 NET STRAW-COCONUT BLANKET
CB	COMPOST BLANKET	FRM	FIBER REINFORCED MEDIUM	DNCS	2 NET COCONUT BLANKET

NOTES:

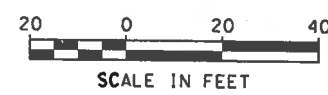
1. ALL SLOPE STABILIZATION OPTIONS ASSUME A SLOPE LENGTH ≤ 10 TIMES THE HORIZONTAL DISTANCE COMPONENT OF THE SLOPE, IN FEET.
2. PRODUCTS CONTAINING POLYACRYLAMIDE (PAM) SHALL NOT BE APPLIED DIRECTLY TO OR WITHIN 100 FEET OF ANY SURFACE WATER WITHOUT PRIOR WRITTEN APPROVAL FROM THE NH DEPARTMENT OF ENVIRONMENTAL SERVICES.
3. ALL EROSION CONTROL BLANKETS SHALL BE MADE WITH WILDLIFE FRIENDLY BIODEGRADABLE NETTING.

REVISION DATE	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
12-21-2015	erosstrat	27287	5	9



BR NOS 097/112, 098/111 & 099/111 PLAN VIEW

SCALE: 1" = 20'-0"

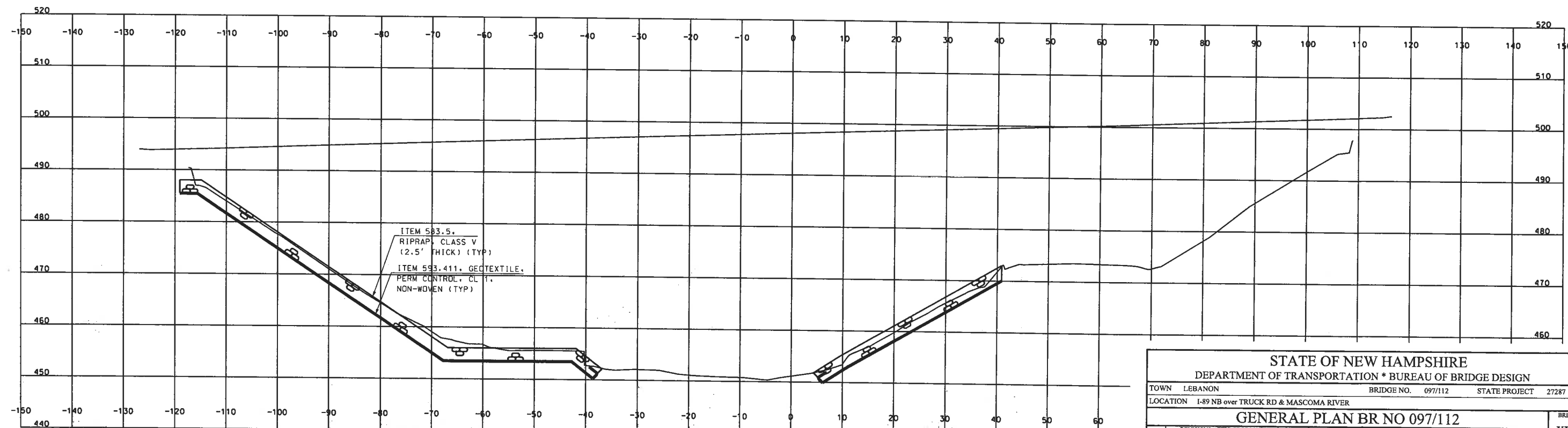
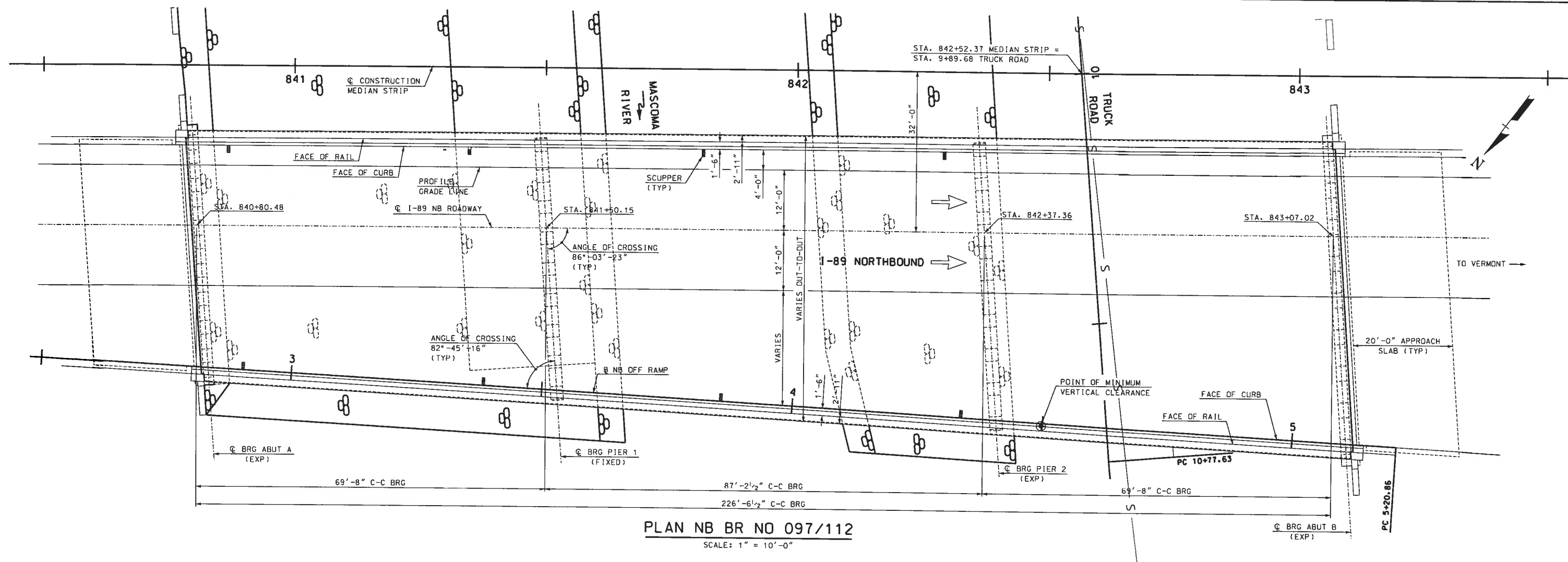


EROSION CONTROL PLAN LEGEND	
	PERIMETER CONTROL SILT FENCE EROSION CONTROL MIX BERM EROSION CONTROL MIX SOX TURBIDITY CURTAIN SHEET PILE COFFER DAM
	NATURAL BUFFER/PERIMETER CONTROL SILT FENCE EROSION CONTROL MIX BERM EROSION CONTROL MIX SOX TURBIDITY CURTAIN SHEET PILE COFFER DAM
	CHANNEL PROTECTION STONE CHECK DAMS STRAW WATTLES CHANNEL MATTING CLASS D EROSION STONE CLASS C STONE
	CLEAN WATER BYPASS PUMP THROUGH PIPE DRAIN THROUGH PIPE OR CHANNEL

WETLAND DELINEATION BY CHRISTOPHER C. DORION, CERTIFIED WETLAND SCIENTIST NO. 251, OF C.C. DORION GEOLOGICAL SERVICES, LLC. DELINEATION OCCURRED ON NOVEMBER 30 AND DECEMBER 12, 2016.

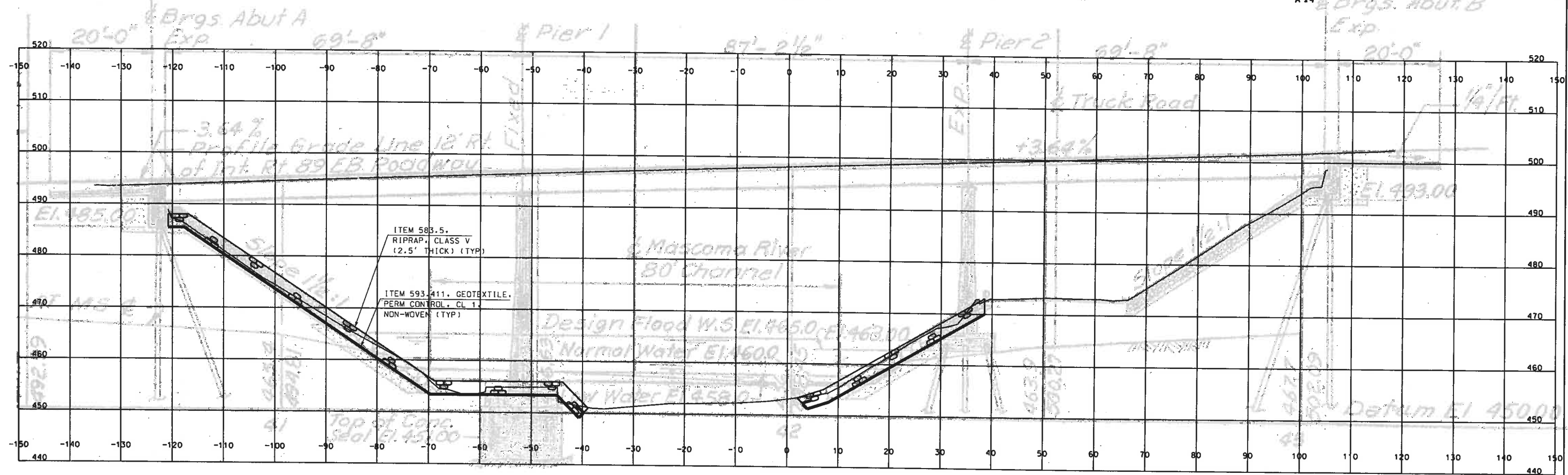
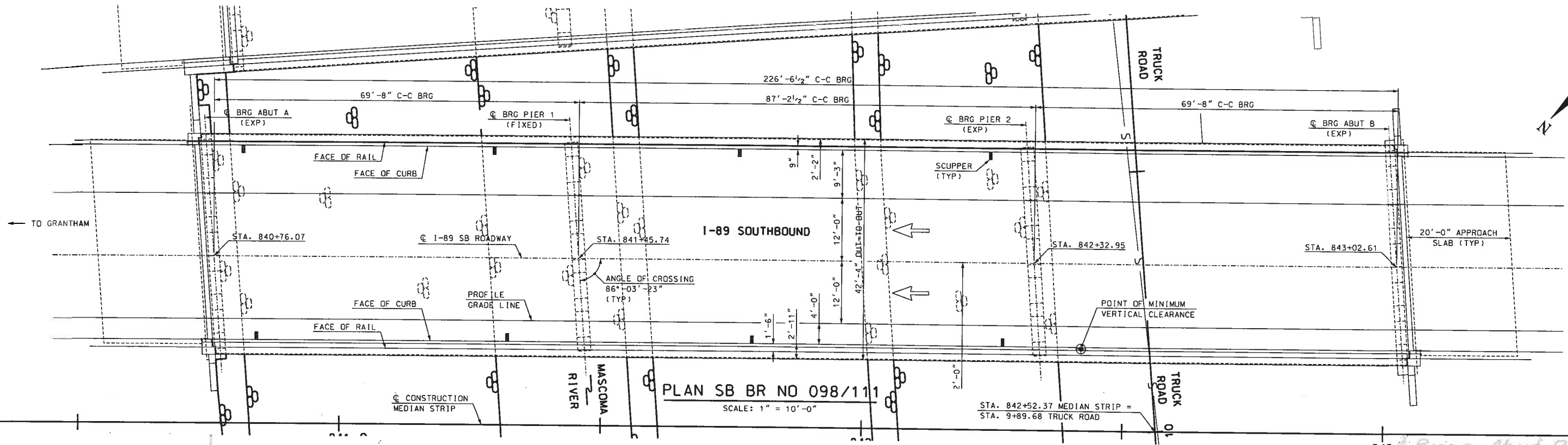
STATE OF NEW HAMPSHIRE										
DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN										
TOWN		LEBANON		BRIDGE NO.		097/112		STATE PROJECT		27287
LOCATION										I-89 NB over TRUCK RD & MASCOMA RIVER
EROSION CONTROL PLAN 097/112, 098/111 & 099/111										
REVISIONS AFTER PROPOSAL		BY	DATE	CHECKED	BY	DATE	BRIDGE SHEET			
		DESIGNED	JAT	4/17	CHECKED	BOEnv	4/17	--- OF ---		
		DRAWN	SMG	4/17	CHECKED	JAT	4/17	FILE NUMBER		
		QUANTITIES	SMG	4/17	CHECKED	JAT	4/17	TOTAL SHEETS		
ISSUE DATE		FEDERAL PROJECT NO.		SHEET NO.		6				
REV. DATE						9				

SUBDIRECTORY	DGN LOCATOR	SHEET SCALE
BRC/CONTRACT #1	097-112 erosion	AS NOTED



STATE OF NEW HAMPSHIRE									
DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN									
TOWN LEBANON		BRIDGE NO. 097/112		STATE PROJECT 27287					
LOCATION I-89 NB over TRUCK RD & MASCOMA RIVER									
GENERAL PLAN BR NO 097/112									
REVISIONS AFTER PROPOSAL		BY DATE		BY DATE		XX OF			
		DESIGNED JAT 12/16		CHECKED XXX XX/XX		FILE NUMBER			
		DRAWN SMG 12/16		CHECKED XXX XX/XX					
		QUANTITIES XXX XX/XX		CHECKED XXX XX/XX					
ISSUE DATE		FEDERAL PROJECT NO.		SHEET NO.		TOTAL SHEETS			
REV. DATE				7		9			

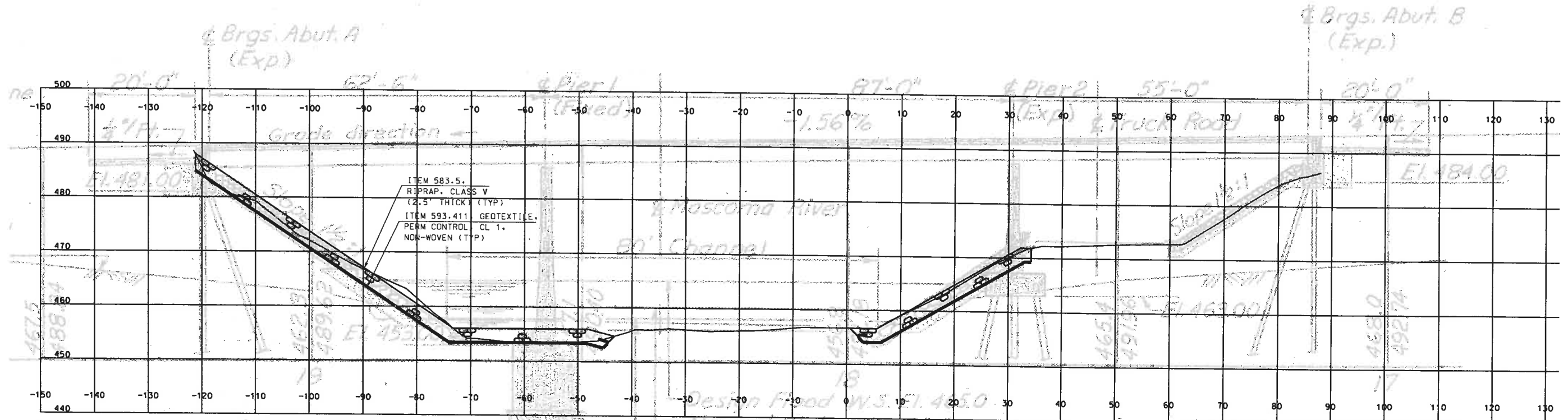
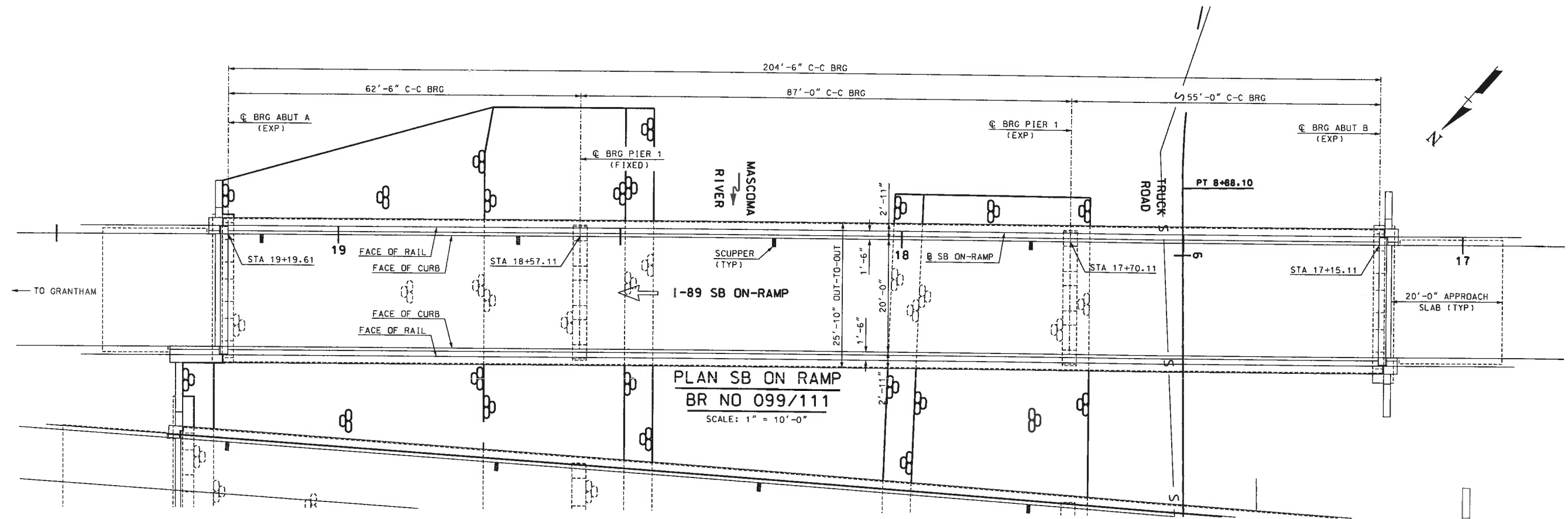
SUBDIRECTORY 112-112-112
 BRG CONTRACT # 112-112-112
 SHEET SCALE 1" = 10'-0"



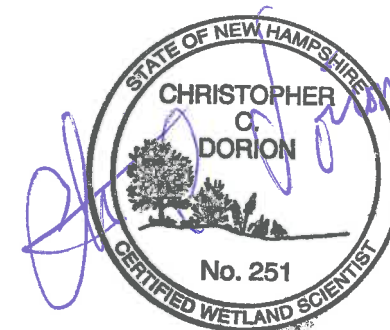
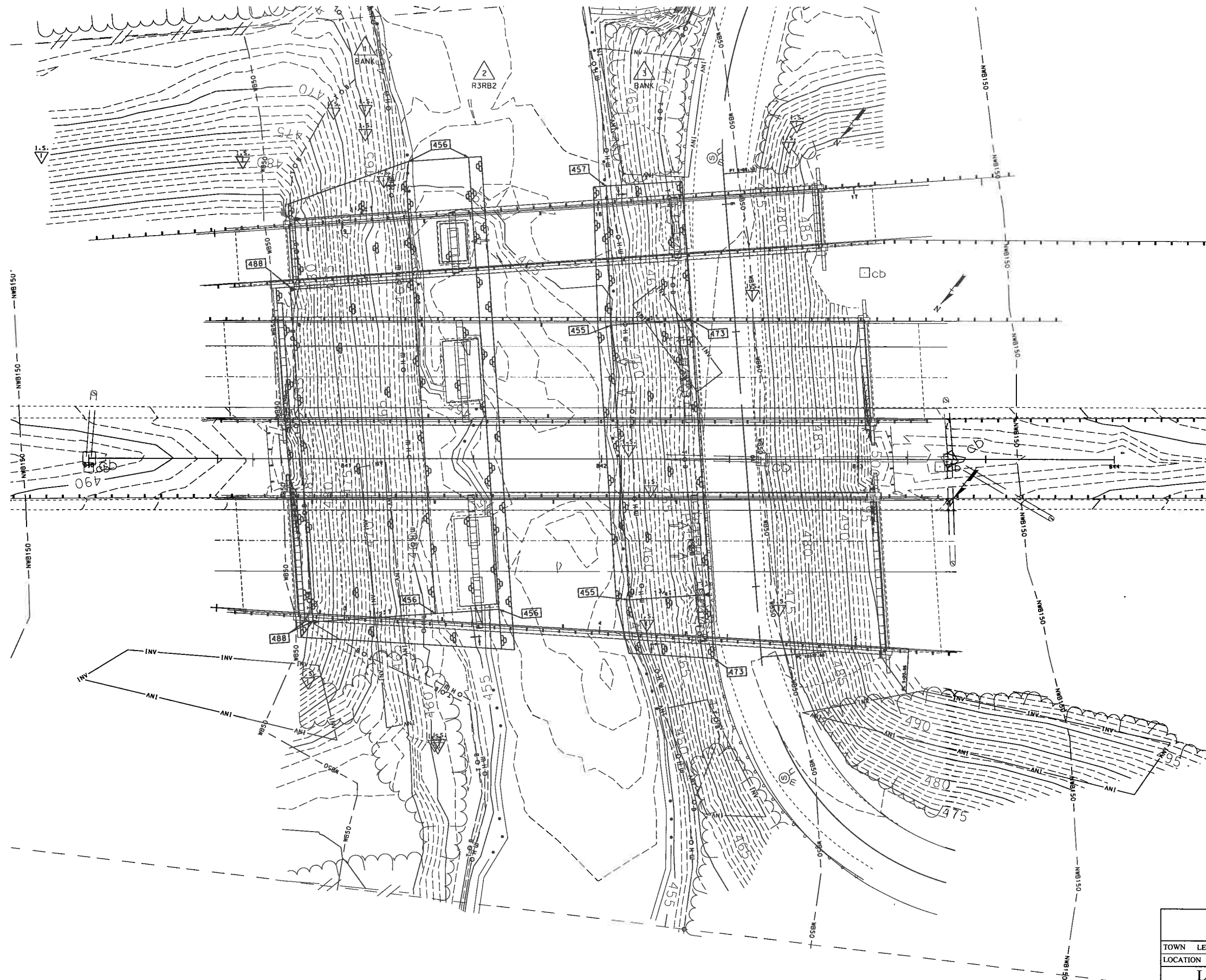
STATE OF NEW HAMPSHIRE									
DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN									
TOWN		BRIDGE NO.		STATE PROJECT					
LEBANON		098/111		27287					
LOCATION I-89 SB over TRUCK RD & MASCOMA RIVER									
GENERAL PLAN BR NO 098/111									
BRIDGE SHEET									
XX OF									
FILE NUMBER									
TOTAL SHEETS									
8									
9									

SUBDIRECTORY		DGN LOCATOR		SHEET SCALE	
BRIDGE CONTRACT #1		098-111, General		1" = 10'-0"	

REVISIONS AFTER PROPOSAL		BY		DATE		BY		DATE	
DESIGNED		JAT		12/16		CHECKED		XXX XX/XX	
DRAWN		SMG		12/16		CHECKED		XXX XX/XX	
QUANTITIES		XXX		XX/XX		CHECKED		XXX XX/XX	
ISSUE DATE						FEDERAL PROJECT NO.		SHEET NO.	
REV. DATE									



STATE OF NEW HAMPSHIRE									
DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN									
TOWN	LEBANON	BRIDGE NO.	099/111	STATE PROJECT	27287				
LOCATION I-89 SB ON-RAMP over TRUCK RD & MASCOMA RIVER									
GENERAL PLAN BR NO 099/111									
REVISIONS AFTER PROPOSAL		BY	DATE	CHECKED	BY	DATE	XX OF		
		JAT	12/16	XXX	XXX	XX/XX	FILE NUMBER		
		SMG	12/16	XXX	XXX	XX/XX			
		XXX	XX/XX	XXX	XXX	XX/XX			
ISSUE DATE		FEDERAL PROJECT NO.		SHEET NO.		TOTAL SHEETS			
REV. DATE				9		9			



STATE OF NEW HAMPSHIRE									
DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN									
TOWN LEBANON		BRIDGE NO. 097/112		STATE PROJECT 27287					
LOCATION I-89 NB over TRUCK RD & MASCOMA RIVER									
LEBANON BR. NOS. 097/112, 098/111 & 099/111									
REVISIONS AFTER PROPOSAL		BY		DATE		BY		DATE	
		JAT		12/16		XXX		XX/XX	
		SMG		12/16		XXX		XX/XX	
		XXX		XX/XX		XXX		XX/XX	
ISSUE DATE		FEDERAL PROJECT NO.		SHEET NO.		TOTAL SHEETS		BRIDGE SHEET	
REV. DATE				1		1		XX OF	

SUBDIRECTORY	DGN LOCATOR	SHEET SCALE
BRC/CONTRACT #1	097-112 scour	AS NOTED